Canadian Solar Export Market Study

Market Data Base and Guide to Export Services

Ontario
Ministry of Energy
Honourable Philip Andrewes
Minister

Energy Ontario

CANADIAN SOLAR EXPORT MARKET STUDY

MARKET DATA BASE AND GUIDE

TO EXPORT SERVICES

Prepared for

The Ontario Ministry of Energy

by

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3.0 MARKET DATA BASE

3.1 Introduction

This volume provides solar market profiles on 40 countries in Latin America, Africa and the Middle East as well as estimating Canadian market share in a selected group of eight promising (target) countries.

Using general economic, demographic and energy data, a solar score for the 119 countries in the study area was derived. From these scores the top 40 countries were selected for more in-depth data collection and further analysis permitted selection of the final eight. A description of the selection process will be found in Section 3.2.

The forty country profiles are the product of extensive data gathering in Canada and the United States, mostly from printed sources.

Up-to-date solar market assessments for the 40 countries were requested from the Trade Commissioner Service. Where responses were received they have been included in the profiles.

Overall market assessments in the eight target countries for individual solar thermal products were made for the period 1983 to 1987. Based on the total market demand, the potential Canadian share in each market was calculated. A five-year time frame was selected to allow for the development of a five-year solar program to aid in the overall marketing effort of Canadian products. This time frame will be necessary to ensure that companies can structure their marketing efforts in a meaningful way.

Assessments of the solar thermal market potential in the eight target countries was extended for an additional fifteen-year period (1988 to 2002) to gain insight into the potential long-term market for these products. Total market demand for all products is presented in Section 3.3.2 (Solar Thermal). Derivation of revenues and Canadian market share will be found in Section 3.3.3. The forty country profiles make up Section 3.3.4 of this volume. Because of the length of material presented, the eight target countries are included with Section 3.1 in Part A. The other thirty-two profiles are arranged in alphabetical order and equally divided between Parts B and C.

The selection of individual countries for analysis could be questioned on the basis of depth of treatment and suitability to the specific unique needs of solar firms. It should be stressed that these data bases are intended as a preliminary step in the process of identifying worthwhile markets. Individual solar companies should use the general data bases and the more specific country quantifications to assist them in their own market intelligence gathering overseas. There is after all no substitute for the on-site assessment that individual entrepreneurs rely upon in making marketing decisions.

The discussion of products and markets keys mostly on Third World or developing countries. A previous study by Middleton and Associates* has reviewed solar thermal development in the United States and opportunities are limited in EEC countries because of trade barriers.

Most solar products have potential markets in the developing and more industrialized countries.

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* Middleton Associates, Solar Equipment Export to the United States and Carribean, I. Lewis, author; Canadian Solar Industries Association, Ottawa, 1981.

The selection of target countries has been made on secondary data and our calculation of overall solar potential. As such, the countries are recommended candidates for further examination by individual solar firms and government agencies. Further studies of these markets is required before and marketing action should be considered. Conversely, countries which are not among the eight selected may offer potential to individual solar companies; they simply are not considered appropriate for extensive industry activity and government support.

TABLE 3.1

WEIGHTING OF COUNTRY INFORMATION

Weighting	Criteria
20	Canadian Representation
5	Size
5	Population
10	National Income
5	NI/Capita
5	Net Energy Imports
10	Energy Consumption
10	Political System
20	Canadian Exports
10	Memberships
100	

TABLE 3.2

ALLOCATION OF POINTS WITHIN EACH CRITERIA

1.	Canadian Representation		/20
	Direct High Commission	-	20
	Direct Embassy	-	18
	Indirect High Commission	-	12
	Indirect Embassy	-	10
	None	-	0
2.	Size (thousand Km^2)		/5
	Greater than 2,000	-	5
	1,000 - 2,000	-	4
	100 - 1,000	-	3
	1 - 100	-	2
	Less than 1	-	1
3.	Population (thousands)		/5
	Greater than 50,000	-	5
	10,000 - 50,000	-	4
	5,000 - 10,000	-	3
	1,000 - 5,000	-	2
	500 - 1,000	-	1
	Less than 500	-	0
4.	National Income	-	/10
	(U.S. Dollars x 10^6)		
	Greater than 150,000	-	10
	100,000 - 150,000	-	9
	50,000 - 100,000	-	8
	10,000 - 50,000	-	7
	5,000 - 10,000	-	6
	2,000 - 5,000	-	5
	1,000 - 2,000	-	4
	500 - 1,000	-	3
	100 - 500	-	2
	10 - 100	-	1
5.	NI/Capita		/5
	100 - 1,000	-	1
	1,000 - 2,000	-	2
	2,000 - 5,000	-	3
	5,000 - 10,000	-	4
	Greater than 10,000	-	5

6.	Net Energy Imports		/5
	(Thousand ton coal equivalents)		
	Greater than 5,000	-	5
	Greater than 4,000	-	4
	Greater than 3,000	-	3
	Greater than 2,000	-	2
	Greater than 1,000	-	1
7.	Energy Consumption		/10
	(Thousand ton coal equivalents)		
	Greater than 100,000	-	10
	50,000 - 100,000	-	9
	10,000 - 50,000	-	8
	5,000 - 10,000	-	6
	1,000 - 10,000	-	5
	500 - 1,000	-	4
	100 - 500	-	2
	10 - 100	-	1
8.	Political System		/10
	Republic	-	10
	Monarchy	-	5
	Socialist	-	0
9.	Canadian Exports		/20
	(Canadian dollars x 106)		
	Greater than 500	-	20
	100 - 500	-	17
	10-100	-	14
	5 - 10	-	11
	.1 - 1	-	5
10.	Memberships		/10
	1. GATT, IMF, IBRD	-	10
	2. GATT	-	5
	3. IMF	-	5
	4. IBRD	-	5
	5. GATT, IMF	-	7
	6. GATT, IBRD	-	7
	7. IMF, IBRD	-	7

TABLE 3.3

COUNTRY SCORES

List of Countries in UN Demographic Yearbook

Africa

Western Africa

	Original Score	Energy Importing Country (+10)	CIDA AID Recipient (+10)	Total Score
Benin	41	10	-	51
Cape Verde	35	10	-	45
Gambia	43	10	-	53
Ghana	72	10	10	92
Guinea	47	10	*10	67
Guinea-Bissau	37	10	-	47
Ivory Coast	72	10	-	82
Liberia	54	10	*10	74
Mali	51	10	10	71
Mauritania	49	10	-	59
Niger	51	10	*10	71
Nigeria	82	-	-	82
St. Helena	13	-	-	13
Senegal	62	10	10	82
Sierra Leone	60	10	-	70
Togo	45	10	-	55
Upper Volta	49	10	*10	69

* These countries are not major recipients of CIDA aid but are likely to be considered in CIDA'S "New and Renewables" energy program, thus they are alloted 10 points.

British Indian Ocean Territory	12	-	-	12
Burundi	42	10	-	52
Comoros	32	10	-	42
Djibouti	38	10	10	58
Ethiopia	63	10	-	73
Kenya	75	10	10	95
Madagascar	59	10	-	69
Malawi	52	10	-	62
Mauritius	49	10	-	59
Mozambique	53	-	-	53
Réunion	20	10	-	30
Rwanda	47	10	*10	67
Seychelles	33	10	-	43
Somalia	43	10	-	53
Uganda	50	10	-	60
United Republic of Tanzania	69	10	10	89
Zambia	69	-	-	69
Zimbabwe	65	-	-	65

Algeria	71	-	-	71
Egypt	79	-	-	79
Libyan Arab Jamahiriya	57	-	-	57
Morocco	73	10	-	83
Sudan	59	10	-	69
Tunisia	70	-	10	80
Western Sahara	-	-	-	-

Middle Africa

Angola (Including Cabinda)	41	-	-	41
Central African Republic	39	10	-	49
Chad	42	10	-	52
Congo	31	-	-	31
Equatorial Guinea	27	10	-	37
Gabon	63	-	-	63
Sao Tome and Principe	34	10	-	44
United Republic of Cameroon	60	-	10	70
Zaire	64	-	-	64

Southern Africa

Botswana	41	-	-	41
Lesotho	43	-	-	43
Namibia	20	-	-	20
South Africa	82	-	-	82
Swaziland	34	-	-	34

Tropical South America

Bolivia	54	-	-	54
Brazil	94	10	-	104
Colombia	81	-	10	91
Ecuador	66	-	-	66
French Guiana	20	10	-	30
Guyana	62	10	10	82
Paraguay	47	10	-	57
Peru	74	10	-	84
Suriname	51	10	-	61
Venezuela	80	-	-	80

Middle America

Belize	37	10	10	57
Canal Zone Panama	26	-	-	26
Costa Rica	66	10	-	76
El Salvador	56	10	-	66
Guatemala	68	10	10	88
Honduras	55	10	10	75
Mexico	84	-	-	84
Nicaragua	58	10	-	68
Panama	57	10	-	67

Argentina	86	-	-	86
Chile	80	10	-	90
Falkland Islands (Malvinas)	10	-	-	10
Uruguay	63	10	-	73

Caribbean

Antigua	26	10	-	36
Bahamas	57	-	-	57
Barbados	61	10	10	81
British Virgin Islands	27	10	-	37
Cayman Islands	26	10	-	36
Cuba	65	10	-	75
Dominica	32	-	-	32
Dominican Republic	62	10	-	72
Grenada	26	10	-	36
Guadeloupe	20	10	-	30
Haiti	63	10	10	83
Jamaica	72	10	10	92
Martinique	21	10	-	31
Montserrat	25	10	-	35
Netherlands Antilles	42	10	-	52
Puerto Rico	64	10	-	74
St. Kitts-Nevis-Anguilla	14	10	-	24
Saint Lucia	36	10	-	46
Saint Vincent and the Grenadines	32	10	-	42
Trinidad and Tobago	67	-	-	67
Turks and Caicos Islands	14	-	-	14
United States Virgin Islands	51	10	-	61
Bermuda	42	10	-	62

Bahrain	49	-	-	49
Cyprus	55	10	-	65
Gaza Strip (Palestine)	10	10	-	20
Iran (To be Included in Asia)	-	-	-	-
Iraq	74	-	-	74
Israel	80	10	-	90
Jordan	51	10	-	61
Kuwait	74	-	-	74
Lebannon	67	10	-	77
Oman	50	-	-	50
Qatar	41	-	-	41
Saudi Arabia	72	-	-	72
Syrian Arab Republic	57	-	-	57
Turkey	80	10	-	90
United Arab Emirates	45	-	-	45
Yemen	28	10	-	38
Yemen, Democratic	40	-	-	40

TABLE 3.4

40 DATA BASE COUNTRIES IN REGIONAL CLASSIFICATIONS

- Africa
  - Western Africa
    - Ghana
    - Ivory Coast
    - Liberia
    - Mali
    - Niger
    - Nigeria
    - Senegal
  - Eastern Africa
    - Ethiopia
    - Kenya
    - Madagascar
    - United Republic of Tanzania
    - Zambia
  - Northern Africa
    - Algeria
    - Egypt
    - Morocco
    - Tunisia
  - Middle Africa
    - United Republic of Cameroon
  - Southern Africa
    - South Africa
- Tropical South America
  - Brazil
  - Columbia
  - Guyana
  - Peru
  - Venezuela
- Middle America
  - Costa Rica
  - Guatemala
  - Honduras
  - Mexico

Temperate South America 3.15
- Argentina
- Chile

Carribean
- Barbados
- Cuba
- Dominican Republic
- Haiti
- Jamaica
- Puerto Rico

Middle East
- Iraq
- Israel
- Kuwait
- Saudi Arabia
- Turkey

British Indian Ocean Territory	12	-	-	12
Burundi	42	10	-	52
Comoros	32	10	-	42
Djibouti	38	10	10	58
Ethiopia	63	10	-	73
Kenya	75	10	10	95
Madagascar	59	10	-	69
Malawi	52	10	-	62
Mauritius	49	10	-	59
Mozambique	53	-	-	53
Réunion	20	10	-	30
Rwanda	47	10	*10	67
Seychelles	33	10	-	43
Somalia	43	10	-	53
Uganda	50	10	-	60
United Republic of Tanzania	69	10	10	89
Zambia	69	-	-	69
Zimbabwe	65	-	-	65

TABLE 3.5

40 DATA BASE COUNTRIES WITH SCORES IN RANKED ORDER

1.	*Brazil	104	21.	Barbados	81
2.	*Kenya	95	22.	Tunisia	80
3.	*Jamaica	92	23.	Venezuela	80
4.	Ghana	92	24.	*Egypt	79
5.	*Columbia	91	25.	Costa Rica	76
6.	Israel	90	26.	Honduras	75
7.	Chile	90	27.	Cuba	75
8.	Turkey	90	28.	Kuwait	74
9.	Tanzania	89	29.	Puerto Rico	74
10.	Guatemala	88	30.	Liberia	74
11.	Argentina	86	31.	Iraq	74
12.	*Mexico	84	32.	Ethiopia	73
13.	Peru	84	33.	*Saudi Arabia	72
14.	Haiti	83	34.	Dominican Republic	72
15.	Morocco	83	35.	Algeria	71
16.	*Nigeria	82	36.	Mali	71
17.	South Africa	82	37.	Niger	71
18.	Senegal	82	38.	Cameroon	70
19.	Guyana	82	39.	Madagascar	69
20.	Ivory Coast	82	40.	Zambia	69

* Target Country

3.3 Assessment of Solar Market Potential in Eight Target Countries

3.3.1 Introduction

Solar energy marketed in the form of direct exports of flat plate collectors or systems or photovoltaic cells or systems or by technological transfer under licence or joint venture has a very large export potential. How large will be dependent on a whole host of factors such as the international price of oil, sources of suitable funding, world recovery from recession, the level of economic growth in the 1980's and 1990's, the technological development and cost effectiveness of new forms of energy such as fusion, hydrogen and renewables -- particularly solar wind and biomass. The key factors are the international price of oil and the importing country's ability to pay for solar products.

What all countries have in common is a need for energy -- energy that can be delivered at prices they can afford to pay. If the price of petroleum products goes up, solar systems in certain applications could be more attractive to them. In any event this analysis assumes that solar systems must reduce significantly in price and efficiency to be acceptable substitutes.

In the target countries, as in most developing and developed countries, this study has found that the best opportunities for flat plate water collectors will be for heating water in domestic commercial (and institutional) and industrial applications and air collectors for commercial crop drying.

As most Third World countries lie within latitudes where monthly average insolation levels are generally higher than in Canada, United States and Europe, they offer potentially more opportunities for solar systems than developed areas.

Most Third-World countries' approach to energy planning is not significantly different from our own. They want to bring about relief from the balance of payments drain of expensive oil imports or inefficient use of highly-valued domestic oil. They are most interested in energy conservation and exploiting conventional sources of energy be it oil, gas, coal or electricity (either hydro- or nuclear-generated). It would be a mistake to assume that Third-World energy planners are looking to renewables technologies as a major solution to their energy problems.

Unlike industrialized countries, developing countries have few human resources and energy-use statistics at their disposal to plan their energy futures -- with the result most countries have only broadly-articulated national energy policies which, invariably, are not translated into useful programs for renewable energy development. The lack of

specific solar development programs makes the selection of target countries more risky. As far as the Canadian industry is concerned, the final selection of target countries must be determined by the proposals received from the industry which reflect where they believe they are most able to compete.

Section 2 provides estimates of demand over the next five years 1983-1987 for solar thermal collectors for the eight target countries.

Section 3 estimates overall sales revenues and Canadian market share.

Total overall sales in these eight countries are estimated at almost $600 million over the next five years. The solar applications for which the greatest market is projected are for domestic hot water systems ($217.5 million) and for crop drying ($150.6 million) followed by commercial/institutional systems ($99 million) and industrial systems ($86.52 million). Given a reasonable level of support from government programs as discussed in Volume 1, Canadian market share in the solar thermal area is predicted between 5% and 8.5% for seven of the eight target countries. This figure, however, will depend on the degree to which Canadian solar products continue to be improved and developed for mass-production. First-generation technology with which the industry is currently working is not economically exported; it is produced with expensive Canadian labour, is heavy and bulky to ship. Such technology can also be readily made almost anywhere with very little capital investment. Developing countries will want to do this in preference to accepting imported finished goods. The future of exporting lies in products which are manufactured in large number by sophisticated and automated machinery. The high cost of such plants combined with low unit output costs give the product greater export potential. The success of the Canadian solar industry in exporting will depend on this higher level of production.

3.3.2 Solar Thermal Product Demand Forecast (1983-1987 and 1988-2002)

Introduction

This section deals with solar thermal applications for hot water in the residential (domestic), commercial/institutional and industrial sectors, and air dryers in agriculture, in the 8 countries identified as having export potential. Generally air collectors for space heating are not required in tropical Third World countries. They are not discussed here.

There may be opportunities for larger-scale solar thermal irrigation and central power systems but these are considered less likely for Canadian industry and are not explored in this analysis either.

Domestic Hot Water

Domestic hot water is in some sense a luxury in the Third World but there is potentially a huge market for simple thermo-syphon systems using inexpensive materials and engineered for easy installation and minimum maintenance.

A simple mass-produced thermo-siphon collector kit, with storage tank and piping would probably have to come in under $750 U.S. installed and more likely in the $500-$750 range to create really large markets in the Third World.

More expensive DHW systems in the $1,000+ installed range will find markets amongst the small populations of rich urban dwellers in Third-World countries and larger populations in the developed world. It is considered that the best markets for DHW/thermosyphon systems are and will be in new urban housing and multiple dwellings and for existing substantial or "acceptable" housing.

Table 3.6 outlines what is calculated to be the level of acceptable housing stock in the 8 promising countries selected; i.e., Brazil, Columbia, Egypt, Jamaica, Kenya, Mexico, Nigeria and Saudi Arabia. Essentially, the figures are based on the assumption that the potential housing stock consists of non-slum and squatter houses in urban areas. Projections should take account of new construction but figures are not available. The results indicate a huge acceptable housing stock of some 7.92 million houses in Brazil and large stocks in Mexico, Egypt, Colombia and Nigeria.

To identify how acceptable solar DHW systems could be, seven pieces of information were collected on each country as outlined in Table 3.7. This information on GDP/capita, energy prices, insolation levels, level of domestic and foreign involvement in manufacture of DHW systems and level of government support was given weighted values as outlined in Table 3.8. A country score was calculated and used as a relative measure of preparedness and acceptance for DHW and from it a penetration rate of existing acceptable housing stock to 1987 and from 1988 to 2002 was derived. The country stores and penetration rates are set out on Table 3.7.

To ensure accuracy with the figures as outlined in column one of Table 3.9 (1983-1987), the demand for Jamaica was

TABLE 3.6

POTENTIAL DEMAND FOR DHW SYSTEMS
IN TARGET MARKETS
(In Millions of Acceptable Housing 1979)

Country	1 Population M	2 Avg. Family Size	No. H/h M	1 % Urban	Tot. Urban H/h M	2 % Accep. Hsng.	Accep. Urban Hsng. M
Brazil	118.7	4.7	25.3	.52	13.20	.60	7.92
Columbia	27.3	5.2	5.3	.70	3.70	.50	1.85
Egypt	43.2	4.9	8.8	.45	4.00	.60	2.40
Jamaica	2.3	3.9	.6	N/A	.60	.70	.42
Kenya	16.4	5.6	2.9	.13	.38	.66	.25
Mexico	69.5	5.8	12.0	.60	7.20	.50	3.6
Nigeria	79.5	5.0	15.9	.26	4.10	.30	1.24
Saudi Arabia	10.5	5.2	2.0	.45	.90	.75	.68

1 UN Statistical Yearbook 1979/80
2 World Housing Survey, UN 1976

N/A = not applicable
H/h = households
M = in millions

TABLE 3.7

CALCULATION OF COUNTRY RATING SCORES AND PENETRATION RATES FOR DHW SYSTEMS

Country	1 Energy Prices GDP/ CAPITA $US 000	Electric $US/KWh	Pet. Prod. $US/US Gal	2 Insolation level Monthly Ave Mega J/m2	Water Temp.	DHW MANU 6 Dom.	For.	Gov't Support	DHW Score	Rate to 1987 (%)	Rate 1988 to 2002 (%)
Brazil	1.60	.07/.04	1.03[3]	15.8	-	yes	unk.	l/m	55.0	.02	.08
Columbia	.87	.01/.01	.80[4]	16.9	-	yes	no	low	37.5	.005	.02
Egypt	.49	.025	.156[4]	20.2	-	yes	yes	med.	54.5	.02	.08
Jamaica	1.10	.097	.92[4]	20.0	-	yes	yes	high	81.5	.08	.28
Kenya	.38	.176/* .148	0	19.7	-	yes	yes	m/h	70.0	.05	.20
Mexico	1.52	.033/ .09	.09[3]	19.0	-	yes	unk	low	44.0	.01	.04
Nigeria	.61	.182/* .145	E.26[4]*	18.5	-	no	no	low	39.0	.005	.02
Saudi Arabia	8.90	.0204	.179[5]	22.0	-	no	yes	low	47.5	.01	.04

1. UN Statistical Yearbook 1979/80
2. World Distribution of Solar Radiation U of Wis.
3. Household Kerosene
4. Light-Heat Oil
5. Diesel Oil (Only Fig. Available)
* 1980 (From World Bank); else 1982 supplied by trade commissioner service
6. See Table 4.3 for explanation of terms
E estimate
unk unknown

TABLE 3.8

WEIGHTED VALUES FOR FACTORS USED
TO DETERMINE COUNTRY RATING SCORES

1. GDP/CAPITA ($US 000) Max. Value = 10

0 - .5	1
.51 - 1.0	2
1.01 - 1.5	3
1.51 - 2.0	4
2.01 - 4.0	5
4.01 - 6.0	6
6.01 - 8.0	8
8.01 +	10

2. ENERGY PRICES Max. Value = 30 (Average of a and b)

(a) Electrical ($US /KWH)

0 - .01	0
.01 - .02	2.5
.02 - .03	5.0
.03 - .04	7.5
.04 - .05	10.0
.05 - .06	11.5
.06 - .07	12.5
.07 - .08	15.0
.08 - .09	17.5
.09 - .10	20.0
.10 - .11	22.5
.11 - .12	25.0
greater than .12	30.0

(b) Petroleum Products ($US/US Gal)

less than .25	10
.25 - .50	15
.50 - .75	20
.75 - 1.00	25
greater than 1.00	30

3. Insolation (Monthly Average Megajoules/M^2) Max Value =20

less than 15	4
15 - 16	6
16 - 17	8
17 - 18	10
18 - 19	12
19 - 20	14
20 - 21	16
21 - 22	18
greater than 22	20

TABLE 3.8 (Continued)

WEIGHTED VALUES FOR FACTORS USED
TO DETERMINE COUNTRY RATING SCORES

4. Manufacturing — Max Value = 15

   (a) Domestic — Max Value = 10

   Yes 10 No 0

   (b) Foreign Involvement — Max Value = 5

   Yes 5 No 0 Unknown 2.5

5. Government Involvement/Support — Max Value = 25

Low	5
L/M	10
Medium	15
M/H	20
High	25

TABLE 3.9

DEMAND FOR SOLAR THERMAL PRODUCTS
IN TARGET MARKETS
1983 to 1987
(M^2)

	1 DHW m2	COMMERCIAL m2	INDUSTRIAL m2	CROP DRYERS m2	TOTAL m2
Brazil	554,400	243,125	225,677	783,680	1,806,882
Columbia	32,375	11,538	5,610	116,596	166,119
Egypt	168,000	73,750	31,095	41,373	314,218
Jamaica	117,600	29,700	10,993	7,770	166,063
Kenya	43,750	32,638	11,543	115,132	203,063
Mexico	126,000	77,275	137,102	91,716	432,093
Nigeria	21,700	6,069	2,626	47,854	78,249
Saudi Arabia	23,800	22,150	7,774	425	54,149
	1,087,625	496,245	432,420	1,204,546	3,220,836

1. Average Size Thermosiphon System = 3.5 M^2
($1m^2$ = 10.7584 sq. ft.)

compared with two previous studies* which attempted to quantify the solar thermal market (including DHW) in about the same time period. The results were similar enough to have some confidence in the methodology.

The accuracy of the forecasts is dependent on the development and marketing of simple thermosyphon systems at prices competitive with electricity or petroleum products such as kerosene and light fuel. To develop the country score and penetration rate, considerable weight, 50%, was given to energy prices and insolation levels. A subjective assessment of the government's concern and interest in renewables (especially DHW) from numerous printed sources, as outlined in the individual country studies, was used in that assessment. A heavy weighting of 25 was considered essential.

The results indicate a potentially huge total of 554,400 m2 of flat plate collector sales in Brazil by 1987. Considerable sales 100,000-200,000 m2 in Egypt, Mexico and Jamaica and 20,000-50,000 m2 sales in Kenya, Columbia, Saudi Arabia and Nigeria. Canadian sales to these countries have so far reached only 1500 systems as the Canadian industry establishes a foothold in these export markets. One Canadian manufacturer has already sold successfully to Saudi Arabia; another to Egypt and Kenya. The Mexican figures are open to question because of government subsidies in the petroleum sector. Recent (December, 1982) changes in government pricing policy, however, show encouraging signs for solar products. The forecast for Kenya may be considerably underestimated since the government is making the installation of solar water heaters mandatory in all new houses to be built in Nairobi and Mombasa. Jamaica has stated a commitment to install 30,000 DHW systems over the next five years as part of a program to reduce its dependence on imported oil from 97% to 64% by 1990.

While the forecasts are considered reasonable it must be stated that it is not uncommon in the Third World to subsidize electrical rates which accounts for low values in Columbia, Egypt, Mexico and Saudi Arabia. Since it is not known how hot water is heated in these countries, an average of electrical and petroleum products was used in the weighting.

DHW demand in M2 for each country for the period 1988 to 2002 is presented in column one of Table 3.10. Given the levels of uncertainty inherent in forecasting so far into

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* Energy Systems International, Preliminary Energy Assessments of Jamaica, US Aid and Department of State, McLean, VA., 1980; Middleton Associates, Solar Equipment Export to the United States and Caribbean, Canadian Solar Industries Association, Ottawa, 1981.

TABLE 3.10

DEMAND FOR SOLAR THERMAL PRODUCTS
IN TARGET MARKETS
1988 to 2002
(M^2)

	1 DHW m2	COMMERCIAL m2	INDUSTRIAL m2	CROP DRYERS m2	TOTAL m2
Brazil	2,217,600	1,458,750	2,256,765	3,134,720	9,067,835
Columbia	129,500	80,763	67,317	932,768	1,210,348
Egypt	672,000	368,750	279,857	82,746	1,403,353
Jamaica	411,600	118,800	34,628	7,770	572,798
Kenya	175,000	130,550	69,259	131,579	506,388
Mexico	504,000	463,650	1,371,020	366,864	2,705,534
Nigeria	86,800	48,550	31,510	765,664	932,524
Saudi Arabia	95,200	132,900	85,512	1,700	315,312
	4,291,700	2,802,713	4,195,868	5,423,811	16,714,092

1. Average Size Thermosiphon System = 3.5 M^2

the future for systems currently being developed the numbers appear to be reasonable.

The figures presented in this analysis are probably conservative.

Commercial/Institutional Hot Water

This market in many ways appears to be the most likely one for solar thermal systems in most Third World countries because, unlike the DHW market which is affected by culturally-determined water-use patterns, the use of hot water in the commercial institutional sector is no different from similar operations in industrialized countries. Solar thermal systems for hospitals and tourist hotels are already being installed in a number of Third World countries. Additional opportunities will develop for schools and universities, and other community facilities and in the commercial establishments such as large restaurants, commercial laundries and film processing centres.

It is understood from 'World Solar Markets' that the Israeli firm, Miromit, opened a plant in Chile in 1982 under licence to sell exclusively to the institutional market. In addition, the same company has a joint-venture in Ecuador which has the capacity to produce 10,000 m2 collectors a year. Since this company is specializing in larger systems, it would be assumed that they are looking at the institutional market in Ecuador as well.

Commercial institutional hot water systems will benefit from improvements in collector design and efficiency and better integration of components. Off-the-shelf pre-packaged systems should be developed that need little or no design modifications to make them suitable for specific applications. This will significantly reduce expensive on-site design and installation problems in countries where there are few skilled tradesmen. It would also help small Canadian industry that has limited human and financial resources for this sort of work.

Marketing would be directed to the potential government sector (institutional) and the private sector (commercial) users probably through local licence or joint-venture partners.

Table 3.11 outlines what could be the potential demand (in 000m2) for flat plate collectors in the 8 countries selected for analysis. The calculations are based on the 1979 estimates of hospital beds and tourists in each country linked to estimates (in m2/hospital bed and m2/tourist) as derived from the U.S. Aid study in Jamaica. Additional demand might be expected to arise from government-supported schools and of-

TABLE 3.11

POTENTIAL DEMAND FOR COMMERCIAL AND INSTITUTIONAL
HOT WATER SYSTEMS
IN TARGET MARKETS
1979
(in 00m2)

	1	2	3	2	4	5			
	GDP/ CAPITA US 000	Number of Hospital Beds (000)	Hospitals Potential (000m2)	Number of Tourists (000)	Hotels Potential (000m2)	Total Hospital & Hotel (000m2)	Other Services (Factor)	Total Other Services (000m2)	Total Potential Comm/Instit. (000m2)
Brazil	1.60	445.818	585.8	764	22.0	607.8	.6	364.7	972.5
Columbia	.87	40.406	53.1	826	23.8	76.9	.2	15.4	92.3
Egypt	.49	78.994	103.8	1,052	30.3	134.1	.1	13.4	147.5
Jamaica	1.10	7.780	10.2	382	11.0	21.2	.4	8.5	29.7
Kenya	.38	17.896	23.5	361	10.4	33.9	.1	3.4	37.3
Mexico	1.52	67.363	88.5	3,637	104.7	193.2	.6	115.9	309.1
Nigeria	.61	53.889	70.8	350	10.1	80.9	.2	16.2	97.1
Saudi Arabia	8.90	11.794	15.5	1,000	28.8	44.3	1.0	44.3	88.6

1. UN Statistical Yearbook 1979/80
2. From The World in Figures Published by the Economist in 198i
3. Based on study of Jamaica which estimated 1.314 m^2/hospital bed
4. As 3. above which estimated .028778 M^2/tourist
5. Based on weighted GDP/capita, Saudi Arabia = 1

schools and office complexes and community facilities and to a lesser extent from private sources in large urban areas such as restaurants and retail outlets. Additional demand was calculated by factoring GDP/capita using Saudi Arabia as 1.

The potential demand is enormous especially in Brazil, Mexico and Egypt. Using the country preparedness and acceptance formula devised for DHW and adapted to commercial/institutional, a country score was derived as shown on Table 3.12. Using the weightings as described in Table 3.8, penetration rates to 1987 and from 1988 to 2002 were derived as shown in Table 3.12. The relative country scores were compared to the U.S. Aid study for Jamaica to ensure relative accuracy of the methodology. The results indicate a close approximation to the Jamaican demand picture (to 1987).

The demand for commercial/institutional hot water systems for 1983 to 1987 and 1988 to 2002 is presented in column two of Tables 3.9 and 3.10 respectively.

The near term picture looks best in Brazil (243,125m^2) with sizeable markets in Egypt and Mexico (75,000 M^2 range) and smaller markets in Kenya, Jamaica and Saudi Arabia. Very small markets appear to exist in Columbia and Nigeria.

In the longer run the demand picture looks good for most countries especially Brazil, Mexico and Egypt. As stated in the DHW forecast these figures are only intended as rough guides to potential. On site research could reveal opportunities or problems that cannot always be foreseen.

The figures presented in this analysis are probably conservative.

Industrial Hot Water

Opportunities for sales of flat plate collector systems for pre-heating industrial hot water also have potentially large applications in the Third World. The pace of development could be considerably slower as this area of solar thermal is not so well advanced as in institutional and commercial applications.

Flat plate systems offer the best opportunities in the pre-heating of boiler water for those industries requiring lower grade process heat (up to the 100°C range). Industries which have been identified as most suitable for this application are food processing, chemical and textile industries. A critical factor in industrial energy costs is the importance of Bunker C as an energy source. Oil companies have been known to cut the price of this product to get rid of

TABLE 3.12

CALCULATION OF COUNTRY RATING SCORES AND PENETRATION RATES FOR COMMERCIAL/INSTITUTIONAL HOT WATER SYSTEMS

	Energy Prices 1			2	Manufacture		7	7			
	GDP/ CAPITA $US 000	Electric $US/KWh	Pet Products $US/US Gal	Insolation level Monthly Ave Mega J/m2	Water Temp	Dom.	For.	Gov't Support	Comm. Hot Water Score	Rate (%) to 1987	Rate (%) 1988-2002
Brazil	1.60	.08	1.03[3]	15.8	-	yes	unk.	1/m	55	.25	1.5
Columbia	.87	.08	.80[4]	16.9	-	yes	no	1/m	50.0	.125	.875
Egypt	.49	.036	.156[4]	20.2	-	yes	yes	m/h	60.5	.5	2.06
Jamaica	1.10	.108	.92[4]	20.0	-	yes	yes	high	83.0	1.00	4.0
Kenya	.38	.118*	1.155*	19.7	-	yes	yes	m/h	77.5	.875	3.5
Mexico	1.52	.068*	E.404*	19.0	-	yes	unk	1/m	55.5	.25	1.5
Nigeria	.61	E.13*	E.25[4]*	18.5	-	no	no	low	39.0	.0625	.5
Saudi Arabia	8.90	.0145	.179[6]	22.0	-	no	yes	1/m	51.5	.25	1.5

1. UN Statistical Yearbook 1979/80
2. World Distribution of Solar Radiation U of Wis.
3. Kerosene
4. Light-Fuel
5. Marine Diesel
6. Diesel
* 1980 (From World Bank); else 1982 supplied by trade commissioner service
7. See Table 4.3 for explanation of terms

E estimate
unk unknown

it, since it is a by-product of petroleum refining. The market of solar industrial hot water systems is not easily predicted from a company energy-cost point of view.

A serious problem in predicting industrial demand in the Third World is the lack of statistics on individual industry sectors in general and their energy use in particular. A recent study by the Ontario Chapter of Friends of the Earth* attempted to identify the industrial energy demand picture in Ontario. The results, as outlined in Table 3.13 are a product of considerable research and some guesswork. It is anticipated that industrial energy profiles for Third World countries are essential to market-planning but will be extremely difficult for Canadian companies to obtain.

Most Third-World countries have agricultural, food processing, textile and printing industries whose process heat demands are in the range ideally suited for flat plate solar collector systems and whose energy-load profile is no different from similar North-American operations.

Industrial hot water systems will benefit from improvements to collector design and efficiency and better integration of components. Zero-storage, Pre-package boiler feedwater systems consisting of collector modules, support structure and piping for specific industrial end use applications would significantly reduce design and installation costs overseas. It would also make the systems more saleable and reduce dependence on technical skills overseas and expensive human resource assistance from Canada.

Marketing would be directed specifically at those companies for which the systems have been designed. Concentration might first be directed at foreign subsidiaries of Canadian companies where possible.

Table 3.14 outlines what could be the potential demand (in 000 m^2) for flat plate collectors in the 8 countries being analyzed. The calculations are based on taking the factor relationship derived from predicted demand in Jamaica and its GDP industrial and applying this factor to the industrial (manufacturing) GDPs of each of the 7 other countries.

The country preparedness and acceptance formula was used in this instance, adapted to the industrial sector using the penetration approach developed in the commercial and insti-

*Soft Energy Path Study Report to Energy, Mines and Resources to be published in 1982

TABLE 3.13

INDUSTRIAL ENERGY USE IN ONTARIO 1978 (PJ)
SOFT ENERGY PATH STUDY (EMR)

Subsector	Heating & Cooling less than 100°C	Electricity Specific	Liquid Fuels	Process Heat 100-260°C	Process Heat 260°C+	TOTAL
1. Agriculture	7.8	3.7	13.3	-	-	24.8
2. Forestry	-	.1	4.4	.2	-	4.7
3. Fishing & Hunting	-	-	-	-	-	-
4. Iron Mines	-	5.0	1.9	4.7	4.7	16.3
5. Other Mines	-	7.3	2.8	6.8	6.8	23.7
6. Food Processing	-	5.0	4.5	22.2	9.5	41.2
7. Pulp & Paper	-	3.0	.1	52.6	28.6	84.5
8. Iron & Steel	-	11.8	1.0	12.7	170.1	195.5
9. Smelting/ Refining	-	1.6	-	1.5	15.8	18.9
10. Cement	-	1.7	-	-	17.9	19.6
11. Chemicals	8.6	2.6	.9	50.3	22.9	85.3
12. Other Manu. Incl. Textiles	.8	32.7	7.7	78.8	82.1	202.1
13. Construction	5.2	-	7.7	-	-	12.9
Totals	22.4	74.4	44.4	229.8	358.4	729.4

TABLE 3.14

POTENTIAL DEMAND FOR INDUSTRIAL HOT WATER SYSTEMS
IN TARGET MARKETS
1979
(In m^2)

Country	Manufacture (% GDP) [1]	Manufacture (billions) $US	Total Industrial m^2 [2]
Brazil	.234	47.90	1,504,510
Columbia	.206	4.70	147,624
Egypt	.215	4.40	138,201
Jamaica	.175	.35	10,993
Kenya	.116	.70	21,987
Mexico	.243	29.10	914,013
Nigeria	.048	2.20	69,101
Saudi Arabia	.045	3.30	103,651

1 UN Statistical Annual 1979/80; The World in Figures, The Economist 1981

2 Raw Score Based on Factor Relationship of GDP Industrial To Industrial Demand in Jamaica

tutional sector. Country rating scores and penetration rates to 1987 and from 1988 to 2000 are outlined in Table 3.15. To account for the potential for competing solar technologies in this field it was decided to allocate 60% of predicted demand in 1987 to flat plate collectors in all countries except Jamaica where solar activities will develop sooner because of the U.S. Aid Program there.

The demand for industrial hot water systems for the period 1983 to 1987 and 1988 to 2002 is presented in column three of Tables 3.9 and 3.10 respectively.

The best short-term markets apear to be in Brazil and Mexico. The Mexican market will be largely dependent on the degree of support given to industry to use domestic natural gas. It is not known where gas pipelines have been built or are planned to be built or how the current foreign-exchange crises would effect these plans. A smaller market appears to exist in Egypt with very small opportunities in the remaining countries.

In the 1988 to 2002 period, huge markets could exist in Brazil and Mexico and considerable opportunities in Egypt. Given the current state-of-the-art and uncertainties in long-term energy use, there is considerable room for error.

The figures presented in this analysis are probably conservative.

Agricultural (Air) Dryers

Open-air drying of crops has been practised for many centuries in agricultural areas around the world. Air drying is used to reduce moisture content in crops and allows them to be stored for long periods.

Open-air drying is appropriate for many uses but has major disadvantages such as the inability to control temperatures, to protect crops from rain, wind or animals; large drying areas are often required. Controlled drying in an enclosed space can avoid these problems.

Some simple direct insolation units are good for crops or products requiring minimal temperature control. Simple solar dryers are usually nothing more than a transparent cover and box in which energy is absorbed and the heat is transferred to air which flows over the produce by convection. This type of drying can be made on site with local materials. It is not considered that a commercial air drying system could be designed to compete in this market.

Sophisticated forced convection units are similar to solar space heating systems. Crops are placed on racks or trays specially designed for them and dried using a small motor

TABLE 3.15

CALCULATION OF COUNTRY RATING SCORES AND PENETRATION RATES FOR INDUSTRIAL HOT WATER SYSTEMS

	1	Energy Prices	7		6	6	6				
					I.H.W. Manual						
	GDP/ CAPITA	Pet. Prod. $US/US Gal	Insolation level Monthly Ave Mega J/m2	Water Temp	Dom.	For.	Gov't Support	I.H.W. Score	% Jamaica	60% to 1987	Rate (%) 1988-2002
Brazil	1.60	.59[2]	15.8	-	yes	unk.	l/m	52.5	.25	.15	1.5
Columbia	.87	.86[2]	16.9	-	no	no	low	40.0	.0625	.038	.456
Egypt	.49	.11 [3]	20.2	-	yes	yes	med	57.0	.375	.225	2.025
Jamaica	1.10	.9142	20.0	-	yes	yes	high	84.0	1.00	0	3.15
Kenya	.38	1.155*	19.7	-	yes	yes	m/h	80.0	.875	.525	3.15
Mexico	1.52	.752*	19.0	-	yes	unk.	low	55.5	.25	.15	1.5
Nigeria	.61	E.255*	18.5	-	no	no	low	29.0	.0625	.038	.456
Saudi Arabia	8.90	.1793	22.0	-	no	yes	low	50.0	.125	.075	.825

1. UN Statistical Yearbook 1979/80
2. Heavy Fuel Oil
3. Diesel
4. Bunker C
5. Marine Diesel

* 1980 (From World Bank); else 1982 supplied by trade commissioner service

6. See Table 4.3 for explanation of terms
7. World Distribution of Solar Radiation U of Wis.

E estimate

unk unknown

and fan to control the flow of air. This type of unit could cost a few thousand dollars and may be worth the cost for delicate and high value products such as fruit, tobacco, fish, and coffee, etc.

There are numerous considerations in predicting the potential market for crop drying equipment. It would seem that high-value crops which are at risk to losses or which need rapid drying for quality control or are currently being dried by heat supplied from petroleum products would be the best candidates for commercial solar air dryers.

Canadian manufacturers would probably do best to concentrate on producing a commercial air dryer specifically for those applications that might lend themselves to multiple use and high-value/high-volume applications. These products might be marketed in the Third World under licence or joint-venture agreements. Exactly what in fact could be exported from Canada and what might be obtained locally is dependent on the type of commerical system developed. Canadian companies could best market technology as opposed to products in this instance.

Putting some figures down on the amount of dryers required in the Third World is extremely difficult at best. This analysis concentrates on 4 products for which crop information is available in the 8 countries: brewers grain, coffee/cocoa, cassava, other grains (wheat, rice, and maize). It represents what may in fact be a minority of the market if such items as lumber, fish and tobacco drying were also considered. The relative amounts in appropriate units of the 4 crops are itemized in Table 3.16. Also included is a measure of lumber production to indicate the magnitude of potential in that area.

Table 3.17 outlines the potential solar dryer market during the years 1983 to 1987 (in m^2) based on U.S. Aid research on Jamaican crop drying potential. A summary is also provided in column four of Table 3.9. Other countries' forecasts are based on their relative production in relation to Jamaica's multiplied by the collector area predicted for Jamaica. An individual country penetration and effectiveness score 1983 to 1987 was based on each country's commercial score. The estimates indicate a huge demand for collectors in Brazil especially for coffee and cocoa and cassava. While it is certainly possible that a coffee/cocoa forced convection dryer could be developed the need for a commercial cassava dryer would have to be investigated further. Large markets also exist in Columbia, Kenya and Mexico, especially for coffee dryers. The statistics also indicate modest markets for grain dryers in all countries.

TABLE 3.16

SELECTED CROP PRODUCTION STATISTICS IN TARGET MARKETS
(In Units 1979)[1]

Country	Coffee/ Cocoa (000 Tons)	Brewers Grain (000 HL)	Other Grain[2] (000 Tons)	Cassava (000 Tons)	Lumber[3] (000m^3)
Brazil	1593	13,980	26,822	24,935	
Columbia	795	7,649	2,802	2,081	24.083
Egypt	0	-	7,301	-	-
Jamaica	4	516	50	10E	-
Kenya	80	1,952	1,800	630	-
Mexico	268	21,642	12,016	-	14.814
Nigeria	180	3,150	1,500	11,500	84.902
Saudi Arabia	-	-	150	-	-

1 From The World in Figures, The Economist, 1981
2 Includes Wheat, Rice and Maize
3 U.S. AID indicated a short term market for Jamaica of 750M^2 for lumber drying. No records can be found of a measurable quantity for the country. It is obviously insignificant by comparison to figures above.
E Estimate

TABLE 3.17

DEMAND FOR AIR DRYING BY CROP
IN TARGET MARKETS
1983 to 1987
(M^2)

Country	Rate (Factor)	Brewers Grain m2	Coffee/ Cocoa m2	Cassava m2	Other Grain m2	Total m2
Brazil	.25	10,404	388,294	308,986	75,996	783,680
Columbia	.125	2,841	96,891	12,894	3,970	116,596
Egypt	.5	-	-	-	41,373	41,373
Jamaica	1.00	1,533	3,900	1,487	850	7,770
Kenya	.875	1,708	68,250	27,324	17,850	115,132
Mexico	.25	5,411	52,260	-	34,045	91,716
Nigeria	.0625	197	10,969	35,625	1,063	47,854
Saudi Arabia	.25	-	-	-	425	425
Total	-	22,094	620,564	386,316	175,572	1,204,546

Predicted demand for the period 1988 to 2002 is presented on Table 3.18. A summary is also provided in column four of Table 3.10. It is assumed that each country could potentially demand its full share of crop drying between 1988 and 2002. The figures could in fact be many times higher for this period especially for Brazil, Columbia, Egypt, Mexico and Nigeria who all have large quantities of either timber, tobacco and fish. Some have all three. Of course this analysis is premised on the assumption that commercial air dryers can be produced and sold in the Third World.

3.3.3 Estimated Sales Revenue For Solar Products and Canadian Market Share

Estimated Sales Revenue in Eight Target Countries 1983-1987

The total value of sales for various solar thermal products in the five years from 1983 to 1987 is presented in Table 3.19. Total collector sales are estimated at $553,826,000 based on average collector price of $200/m2 Canadian and an average air collector price of $200/m2. All prices are expressed in 1982 dollars. These sales figures do not include balance of system costs which are expected to exceed collector costs by a factor of two in each instance over the next five years.

The revenue forecast indicates that solar product share in the eight target countries will be: domestic hot water systems 37.1%, crop drying equipment 25.6%, commercial/institutional 16.9%, industrial 14.7%

A breakdown of potential product sales by country is presented in Table 3.20. This table clearly shows that Brazil offers the largest market for solar products -- some $309 million over the next five years -- dominated by domestic hot water systems and crop drying. There are also substantial markets in Mexico ($83.8 million) and Egypt ($61.7 million) and medium-sized markets ($25-35 million) in Kenya, Jamaica and Columbia. Nigeria and Saudi Arabia appear to offer the poorest markets for solar products.

Estimated Canadian Share of the Solar Product Market

This analysis of the estimated Canadian share of the solar product market in the eight target countries is based on two assumptions:

. that current licence/joint-venture agreements or negotiations will in fact lead to significant sales during the 1983-1987 time period.

TABLE 3.18

DEMAND FOR AIR DRYING BY CROP
IN TARGET MARKETS
1988 to 2002
(M2)

Country	Rate (Factor)	Brewers Grain m2	Coffee/ Cocoa m2	Cassava m2	Other Grain m2	Total m2
Brazil	1.00	41,616	1,553,175	1,235,945	303,984	3,134,720
Columbia	1.00	22,728	775,128	103,152	31,760	932,768
Egypt	1.00	-	-	-	82,746	82,746
Jamaica	1.00	1,533	3,900	1,487	850	7,770
Kenya	1.00	1,952	78,000	31,227	20,400	131,579
Mexico	1.00	21,644	209,040	-	136,180	366,864
Nigeria	1.00	3,152	175,504	570,000	17,008	765,664
Saudi Arabia	1.00	-	-	-	1,700	1,700
Total	-	92,625	2,794,747	1,941,811	594,628	5,423,811

TABLE 3.19

SALES VALUE OF SOLAR COLLECTORS
IN TARGET MARKETS
1983-1987

System	Demand M^2	Collector Value (in units) $/$M^2$	Sales Value $ Canadian
Domestic Hot Water	1,087,625	200	$217,525,000
Commercial	496,245	200	99,249,000
Industrial	432,420	200	86,484,000
Crop Drying	1,204,546	200	150,568,000
Total Sales			$553,826,000

TABLE 3.20

SALES VALUE OF SOLAR COLLECTORS
BY PRODUCT
IN EACH TARGET MARKET
1983 to 1987
$ CANADIAN

Country	DHW $000	Commerical $000	Industrial $000	Crop Drying $000	Total Sales $000
Brazil	110,880	48,625.0	45,135.4	97,960.0	302,600
Columbia	6,475	2,307.6	1,222.0	14,574.5	24,479
Egypt	33,600	14,750.0	6,219.0	5,171.6	59,740
Jamaica	23,520	5,940.0	2,198.6	971.3	32,629
Kenya	8,750	6,527.6	2,308.6	14,391.5	31,977
Mexico	25,200	15,455.0	27,420.4	11,464.5	79,539
Nigeria	4,340	1,213.8	525.2	5,981.8	12,060
Saudi Arabia	4,760	4,430.0	1,554.8	53.1	10,797
	217,525	99,249.0	86,484.0	150,568.3	553,821

- that Canadian government programs will remain more or less unaltered in terms of current levels of funding commitments to the solar industry.

To determine what share of the market Canadian solar thermal manufacturers might expect, individual solar thermal scores were calculated for each of the eight target countries. These scores, combined with the assessment of Canadian products and companies' export capability were used to determine market share percentages and actual forecast revenues. The results are presented on Table 3.21.

Six pieces of information were used to determine country product scores: 1979-1981 average CIDA expenditures, status as a CIDA Industrial Co-operation country, level of EDC support for Canadian business in general, percentage of imports from Canada, level of Canadian Solar manufacturer's involvement and commonwealth membership. Each piece of information was given a weighted value as outlined in Table 3.22. Considerable weight was given to two factors: Canadian solar manufacturers' involvement (40%) and percentage of Canadian imports (30%). The reasoning for the high weights is based on the fact that firm commitments to export and level of Canadian imports as a measure of commercial ties are key ingredients in helping to assess what share of the market Canadian manufacturers are likely to gain.

For solar thermal products Jamaica rated the highest (84.5) followed by Egypt, Brazil, Kenya, Columbia, Nigeria, Mexico and Saudi Arabia. Only Saudi Arabia seems to be a poor market for Canadian manufacturers.

The country scores for solar thermal have been directly translated into market share. It was felt that the products are comparable to the competition and that the share seems reasonable for the current export position of Canadian solar companies.

The results of the analysis reveals a potential market for solar thermal of $20.3 million in Brazil, $4.4 million in Egypt, $4.0 million in Mexico, $2.8 million in Jamaica, $2.1 million in Kenya and $1.4 million in Columbia. Small markets probably not worth persuing exist in Nigeria and Saudi Arabia. Current 1981 export sales of the larger solar thermal companies total $820,000 to all of Africa and $90,000 to all of Latin America.

It should be reiterated that balance-of-system revenues where relevant would be twice the expected collector sales.

TABLE 3.21

CALCULATION OF CANADIAN MARKET SHARE
IN EIGHT TARGET MARKETS
1983-1987
$000 CAN

	CIDA $ 3 YR AVE (MN) $CDN	CIDA INC COUNTRY	LEVEL OF EDC SUPPORT	CDA % IMPORTS	CDN SOLAR THERMAL INVOLVE-MENT	COMMON-WEALTH	SOLAR THERMAL SCORE	CDN SOLAR THERMAL MARKET SHARE %	TOTAL REVENUE SOLAR THERMAL $000
Brazil	2.22	Yes	Large	.02	C	-	66.5	.067	$20,274.2
Columbia	6.87	Yes	Large	.04	N	-	59.0	.059	1,444.3
Egypt	16.73	Yes	Small	.015	C	-	72.5	.073	4,361.1
Jamaica	7.77	Yes	NIL	.06	C	x	84.5	.085	2,773.5
Kenya	12.17	Yes	NIL	.013	C	x	65.0	.065	2,078.6
Mexico	-	Yes	Large	.03	N	-	50.0	.05	3,977.0
Nigeria	.93	Yes	NIL	.01	C	x	56.0	.056	675.4
Saudi Arabia	-	No	NIL	.015	T	-	17.5	.018	194.4

C = Commitment
N = Negotiating
T = Talking
N/C = No Contact

TABLE 3.22

WEIGHTED VALUES FOR FACTORS USED TO
DETERMINE COUNTRY RATING SCORES

1. CIDA Funding (3 Year Average): Maximum Value = 10

   The country with maximum funding was given 10 points. Points were awarded to other countries on the basis of their percentage relationship with the most financially supported country.

2. CIDA Industrial Cooperation Country: Maximum Value = 5

   Yes 5 No 0

3. Export Development Corporation Funding: Maximum Value = 30

   Large 10 Small 5 NIL 0

4. Percentage of Canadian Imports Maximum Value = 30

   The country with the largest percentage was given 30 points. Points were awarded to other countries on the basis of their percentage relationship to the country who imported the most.

5. Canadian Solar Manufacturers Involvement: Maximum Value = 40

   Firm Commitment 40 Negotiating 20 Talking 10
   No Contact 0

6. Membership in Commonwealth Maximum Value = 5

   Yes 5 No 0

3.3.4 Market Data Base

This section contains the forty country profiles. The eight target countries are included in Part A; the remaining thirty-two profiles are arranged in alphabetical order and equally divided between Parts B and C.

The numbering system of the profiles deviates from the standard numbering system of the rest of the report. Initially it was intended to put these profiles into a computer to allow firms in the industry easy access to them. This may in fact be done if the response is favourable. The numbering system was devised to permit addition of new pieces of information into the computer data base as they were collected.

Each profile is broken down into four parts:

General Country Information:	Part A
Energy Specific Information:	Part B
Solar Specific Information:	Part C
Market Assessment:	Part D

The demand and revenue statistics discussed separately in Sections 3.3.2 and 3.3.3 have been included in the profiles of the eight target countries.

Canadian Solar Industries Association Inc.
67A Sparks Street
Ottawa, Ontario K1P 5A5
(613) 237-7000

L'Association des Industries Solaires du Canada Inc.
67A rue Sparks
Ottawa, Ontario K1P 5A5
(613) 237-7000

CANADIAN SOLAR EXPORT MARKET STUDY

GUIDE TO EXPORT SERVICES

Prepared under funding for the Ontario Ministry of Energy

by

The Canadian Solar Industries Association Inc.

November 1983

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INTRODUCTION

The purpose of this guide is to summarize all the major programs, services and facilities that are available to solar exporters. Included in this guide are services provided by the Federal and Ontario governments, the Canadian Chartered Banks and the Canadian Export Association and Canadian Manufacturers Association. In addition, the workings of the General Agreement on Tariffs and Trade and the solar programs of agencies such as the International Development Banks and the United Nations and its agencies are discussed. Readers will find a method suggested for tapping into multilateral agency projects on page 65.

It is hoped that this guide will provide exporters or would be exporters with a source document that will aid in the complicated business of solar exporting. The document is not intended to cover everything you ever wanted to know about exporting but it does provide, through its Table of Contents and Index, ready access to most types of information solar exporters require. Readers are specifically directed to look at the section of the Index called export marketing. It provides at a glance a ready access to the services listed in the Table of Contents.
There are a lot of does and don'ts in exporting and opportunities are best for those who can deliver the right product at the right price in the best markets. Clearly considerable market research is required. Exporting is expensive and time consuming and companies must develop marketing plans that are reasonable and achievable.

Exporting is more difficult than domestic selling. The risks rise the further the markets are from your base of operations and the less developed the commercial infrastructures and the economies you are exporting to.

Perhaps the best general export guide available is Understanding Exports which is published by the Canadian Manufacturers Association. An outline of its contents will be found on page 61.

It is highly recommended that solar exporters considering overseas markets for the first time should purchase this book and use it along with this guide.

The CMA has a 10 point check list that all exporters should consider in developing an export marketing strategy.

- Make firm long-term export plans.
- Manufacture and supply the right product for the market.
- Institute a simple and logical system for costing for exports.
- Offer reasonable credit terms.
- Employ personnel who are experienced in export and travel and who know the languages.
- Visit customers through regular trips overseas and do not attempt to organize exports solely from the desk in the home office.
- Support your product and your visits to customers abroad with attractive multi-lingual promotional literature and advertising.
- Use the right approach in your overseas dealings; acquaint yourself with local conditions and customs, make your contacts in a friendly manner; diligently avoid the "hard sell" approach.
- Never commit yourself to an arrangement you cannot fulfill. Nothing does more harm than to fail to live up to undertakings on prices, or on deliveries and servicing of export customers.
- Exhibit at trade fairs abroad.

Exporters who use this Guide should take note that the services provided by Industry, Trade and Commerce are currently being divided between the Department of External Affairs and the new Department of Regional Industrial Expansion. This Guide reflects current understanding as to how these responsibilities will be allocated.

CANADIAN INTERNATIONAL DEVELOPMENT AGENCY (CIDA)

CIDA administers Canada's development co-operation programs in over 70 of the world's poorest countries in Asia and Africa and to a lesser extent in Latin America. It relies on private enterprise such as private contractors, consultants, trading houses, suppliers and manufacturers in Canada to assist in the implementation of many of its projects. There are three main programs that solar manufacturers should be familiar with.

BILATERAL PROGRAMS

The Bilateral Branch has primary responsibility for the design of multi-faceted programs CIDA operates in each recipient country, based on agreements between governments. Bilateral programs account for about 50% of CIDA'S budget. To avoid spreading resources too thin, bilateral concentrates on "core" countries (mostly Asian and African) selected mainly on the basis of need and their ability to use Canadian assistance to best advantage. Other developing countries receive aid on a project by project basis.

Funds are allocated as grants or soft loans to the developing country. Usually the contractor for grants will be CIDA or the Department of Supply and Services. For loans the contractor is usually the recipient country or its agent. In some countries CIDA provides loans in the form of lines of credit. This means that the recipient or its agent purchases goods or services direct from Canadian private business. CIDA can make available to exporters a list of these countries.

NEW AND RENEWABLES PROGRAM (BILATERAL)

Prior to 1981 CIDA funds for energy projects were limited. However, in recent years the drain on developing countries balance of payments caused by massive increases in price of imported oil has seriously threatened development progress. CIDA, in recognition of this fact is in the process of developing a new and renewables program. About $25 million will be allocated to bilateral programs over the next 5 years. An additional $10 million has been allocated to I.D.R.C. and $5 million to CIDA's Industrial Co-operation Program. The major area of CIDA's bilateral energy aid will be in Francophone Africa i.e. from Morocco and Algeria south through central Africa to Zaire. It is likely that the program will concentrate on the poorest countries especially in the Sahel region; namely, Senegal, Mali, Upper Volta and Niger.

OBJECTIVES

The energy program will attempt to assist the poorest regions in these countries by helping to eliminate some of the causes of increasing desertification and famine. In the energy area this would mean providing alternatives to collection of firewood, burning of dung and increasing the availability of water. This would mean grants and perhaps loans for the following types of assistance:

1. technical assistance for building and using solar and renewables technologies

2. infrastructure reinforcement through irrigation, wells, etc.

3. development of energy conservation programs

4. assisting in local energy research

5. demonstration projects using flat plate collectors, photovoltaic systems, wind generators, etc. in rural applications.

APPLICANT ELIGIBILITY

Not finalized as yet. It is assumed that any new and renewables company with the technical skills and/or hardware suitable for rural applications could benefit greatly from this program. As with the Industrial Co-operation Program, it is expected that the product/service must clearly have some potential for aiding in the development of a backward region. The company must also have sufficient financial, managerial and technical resources to carry out projects without impairing its own survival. Canadian content will likely be monitored by two conditions:

1. overall project content must be 51% Canadian

2. design and installation must be by Canadian firms

To be eligible all Canadian firms must register with the Department of Supply and Services. DSS reviews each company's capability of supplying products and services for the domestic as well as export market. Companies listed as having the products/services required for any particular contract will be notified and allowed to bid on such contracts.

For more information on DSS registration contact:

R.A. Rich
Director
Transportation and Energy Products Centre
Department of Supply and Services
Place du Portage, Phase 3
11 Laurier Street
Hull, Québec
K1A 0S5
(613) 997-5860

For more information on CIDA's bilateral new and renewables program contact:

Gil Bouchard
Sector Chief
Energy Sector
Canadian International Development Agency
200 Promenade du Portage
Hull, Québec
K1A 0G4
(819) 994-1474

MULTILATERAL PROGRAMS

The Multilateral Programs Branch provides funds (about 40% of CIDA's budget) to multilateral agencies such as UN and its agencies and the international development banks. These agencies use the funds for their lending programs or in direct purchases of goods and services. Canadian involvement in these agencies allows Canadian owned or based companies to take part in or compete for contracts in these programs which are now running at $25 billion annually. CIDA does not provide information to potential exporters on individual projects of the international agencies. Its multilateral contributions are used at the discretion of the donor agencies most of which have their own energy programs. See sections under the United Nations and Multilateral Development Banks.

INDUSTRIAL CO-OPERATION DIVISION

RENEWABLE ENERGY TECHNOLOGY DEVELOPMENT PROGRAM

This is a new program administered by the Industrial Co-operation Division of CIDA. About $5 million has been earmarked for this program over the next 5 years.

Numerous solar manufacturers are already using this program to access foreign markets. It allows smaller companies with limited resources opportunities to make contacts and to export to selected third world countries.

OBJECTIVES

1. To assist oil importing developing countries to reduce their needs for oil and thus aid their balance of payments problems by encouraging the use of renewable energy technologies.

2. To fund demonstration projects designed to improve agricultural production and agro-industries in developing countries (see list of eligible countries below) and at the same time establish a strong Canadian technological base so that the renewables industry can be internationally competitive.

3. Long term objectives must include plans for joint ventures, direct investment, licensing, co-production arrangements or long term management contracts not simply exporting solar products.

TYPES OF ASSISTANCE AVAILABLE

1. Starter/Feasibility Studies

   Up to $10,000 (starter) and $100,000 (feasibility) could be available to investigate opportunities in developing countries for:

   (a) joint ventures
   (b) direct investment
   (c) licensing agreements
   (d) co-production arrangements
   (e) long term management contracts

   Funds for starter studies could involve:

   (a) return economy airfare
   (b) accommodation and living expenses
   (c) support services

Funds for feasibility studies could involve:

(a)	return economy airfare	100%
(b)	accommodation and living expenses	100%
(c)	consultant fees and travel costs	50%
(d)	product/process/material suitability testing	50%
(e)	travel and expenses to Canada for personnel from a developing country	50%

2. Canadian Renewable Energy Facility (C.R.E.F.)

Up to $250,000 per project for up to 100% of the net costs to test and adapt manufacturer's technology in developing countries as a lead in to long term cooperation with their developing country counterparts. Funds could be available for:

(a) one test at any discrete stage in the technological development of a rapidly evolving technology such as evacuated tubes or photovoltaics

(b) two tests for stable technologies such as flat plate collectors.

Other Program Elements

There are three (3) additional elements to this program which are being worked out. Briefly they may provide additional assistance in the following areas:

3. Project Support

Funds could be made available to improve the infrastructrure of a project which by its very nature would not need such assistance in markets with more mature delivery systems.

4. Information Dissemination

Funds could be made available to identify more information to a manufacturer in Canada or in developing countries abroad about each other's potential for co-operation.

5. Technical Assistance

Funds could be made available to aid Canadian manufacturers to enable them to match their technical capabilities to developing country needs.

ELIGIBLE COUNTRIES

Africa

Algeria
Angola
Benin
Botswana
Burundi
Cameroon
Cape Verde Islands
Central African Republic
Chad
Comoros
Congo
Egypt
Equatorial Guinea
Ethiopia
Gabon
Ghana
Guinea
Guinea-Bissau
Ivory Coast
Kenya
Lesotho
Liberia
Madagascar
Malawi
Mali
Mauritania
Mauritius
Morocco
Mozambique
Niger
Nigeria
Rwanda
Sao Tomé and Principe
Senegal
Seychelles
Sierra Leone
Somalia
Sudan
Swaziland
Tanzania
Togo
Tunisia
Uganda
Upper Volta
Zaire
Zambia
Zimbabwe

Asia

Bangladesh
Bhutan
China, People's Rep.
Cook Islands - Fiji
India
Indonesia
Korea, Republic of
Lebanon
Malaysia
Maldives
Jordan
Nepal
New Hebrides
Papua New Guinea
Philippines
Singapore
Pakistan
Sri Lanka
Syria
Thailand
Tokelau
Tonga
Turkey
Western Samoa
Yemen Arab Rep.
Yemen People's Democratic Rep.

Latin America

Argentina
Bolivia
Brazil
Chile
Colombia
Costa Rica
Ecuador
El Salvador
Guatemala
Guyana
Honduras
Mexico
Nicaragua
Panama
Paraguay
Peru
Uruguay

Caribbean

Antigua
Barbados
Belize
Cayman Island
Dominica
Dominican Rep.
Grenada
Haiti
Jamaica
Montserrat
St. Kitts
St. Lucia
St. Vincent
Trinidad & Tobago
Turks & Caicos
Virgin Islands (Br.)

APPLICANT ELIGIBILITY

Those solar companies which have a product or technical expertise or are developing a product that could be suitable for transfer to developing countries. The product must clearly have some potential for aiding in the development of the countries where it would be marketed. The company must have sufficient financial, managerial and technical resources to carry out the work without impairing its own survival. Canadian content in the program will be monitored by three conditions of purchase:

1. overall project content must be 51% Canadian

2. design and installation must be by Canadian firms

3. long term objectives must include plans for joint venture/licensing, etc. in developing countries

To be eligible all Canadian firms must register with the Department of Supply and Services. DSS reviews each company's capability of supplying products and services for the domestic as well as export market.

For more information on DSS registration contact:

R.A. Rich
Director
Transportation and Energy Products Centre
Department of Supply and Services
Place du Portage, Phase 3
11 Laurier Street
Hull, Québec
K1A 0S5
(819) 997-5860

For more information on the Industrial Co-operation Program contact:

Marie Paule Allaire
Program Manager
Industrial Co-operation Program
Canadian International Development Agency
140 Promenade du Portage
Hull, Québec
K1A 0G4
(819) 997-7901

DEPARTMENT OF EXTERNAL AFFAIRS

TRADE COMMISSIONER SERVICE

The service maintains a worldwide network of offices to assist companies seeking export markets. It deploys about 400 officers among 91 posts in 67 countries around the world. A small Ottawa headquarters staff is responsible for the general management of the Trade Commissioner Service. Exporters or potential exporters can contact Trade Commissioners through the nearest regional office of the Department of Regional Industrial Expansion. A listing of these offices will be found under that Department. The Regional Offices will put the would-be exporter in touch with the appropriate regional desk of the International Bureaux in Ottawa (in a summary of what this Bureaux does see separate entry) or the Construction and Consulting Services Branch (the solar products branch) one of the Industry Section Branches of the Department of Regional Industrial Expansion (for a summary of what the Branch does see separate entry). From the former the exporter can identify the Trade Commissioner(s) to contact and from the latter the markets of potential interest.

OBJECTIVES

1. Act as the focal point in foreign markets for the Government of Canada's efforts to promote the export of Canadian goods and services.

2. Represent and defend Canadian trade interests before local government and analyze and report on local legislation and commercial practices that impact on Canadian trade relations and trade policy.

3. Advise and assist Canadian companies seeking out and securing foreign joint venture and licensing opportunities of benefit to Canada.

4. Encourage foreign companies to undertake investment in Canada as a contribution to Canadian technology, productive capacity and employment generation.

5. Analyze and report on local policy developments that could influence policy formulation by Canadian government departments.

TYPES OF SERVICES AVAILABLE

1. Assessing a New Market Abroad

The Service can supply the following types of information to Canadian firms:

(a) Market Requirements

(i) product production: domestic and imported
(ii) product user profiles
(iii) market development strategy for a Canadian product unknown in local market
(iv) size of potential market

(b) Tariff and Trade Regulations

(i) customs classifications
(ii) rates of duty
(iii) Canadian tariff relative to competing countries
(iv) import and exchange controls

(c) Competition

(i) competitors: their products and prices
(ii) length of establishment in the market
(iii) product credit arrangements
(iv) foreign competitors arrangements with local representatives

(d) General Business Information

(i) how to conduct business in the market
(ii) relevant economic conditions
(iii) market infrastructures: banking, shipping, etc.

2. Establishing a New Exporter in the Market

The Service can assist a firm to establish itself in new markets as follows:

(a) selecting suitable agents

(b) providing contacts to Canadian firms to promote further discussions

(c) assessing capability of local firms

(d) arrange for a representative of a Canadian firm to visit the market if the Trade Commissioner deems it appropriate

(e) to provide back-up assistance to visit of exporter as appropriate - this could include arranging appointments, translators, legal counsel, etc.

3. Ensuring that Trade Flows Continue

The Service can aid established exporters as follows:

(a) working with agents
(b) smoothing problems with government laws and regulations
(c) helping to settle trade disputes
(d) guidance in debt collection matters

APPLICANT ELIBILITY

Many Canadian firms utilize the services of the trade offices abroad, thus there are limits as to what a Trade Commissioner can offer an individual firm. Generally speaking, the Regional Offices and Products Branch of R.I.E. and the International Bureaux of External Affairs filter requests for information and assistance. In some instances the information may be available in house. While the access to Trade Commissioners is open to any Canadian firm, the degree to which assistance will be provided to solar firms is based on the Construction and Consulting Services assessment of the strength and capability of the solar industry and firms within it. Those Canadian firms who ultimately must benefit from the Service are likely to have the following characteristics:

A competitive exportable product and sound business experience as determined by the appropriate Products Branch within R.I.E.

This does not mean that a developing industry such as solar is discriminated against. It just means that to maximize the limited resources available, the government gives more priority to more established industries in the export market area.

For more information see list of Regional Offices of the Department of Regional Industrial Expansion on page 26.

DEPARTMENT OF EXTERNAL AFFAIRS

INTERNATIONAL BUREAUX

The International Bureaux are administered by the Department of External Affairs. They are the central points of contact for business on matters affecting Canada's trade and economic relations with other countries and areas. The Bureaux, as its name implies, is broken up into three (3) regional components: European; Pacific, Asian, African and Middle East; and Latin America and Caribbean.

OBJECTIVES

To provide intelligence on Canada's trade with other countries and to develop trade relations and export marketing strategies for those areas.

TYPES OF SERVICES AVAILABLE

1. Market Information

   (a) general economic outlook for countries and areas, in the publication Markets for Canadian Exporters (by country) prepared by the trade commissioners in the countries themselves

   (b) specific market information for particular products

2. Market Access Information

   Comprehensive information on tariffs, regulations, licensing, standards, documentation, etc.

3. Special Access Assistance to U.S.A.

   Information on U.S. classifications, valuation, non-tariff access requirements and special trade problems.

APPLICANT ELIGIBILITY

The International Bureaux is set up to aid any Canadian firm gain information about export markets. Its services are available to all.

For more information about services, countries or regions contact:

F.R. Petrie
Director General
Bureau of Pacific, Asian, African and Middle East Affairs
(613) 995-2888

J.A. Elliot
Director General
Bureau of Latin America and Caribbean Affairs
(613) 996-5533

J.E. Gibson
Director General
Bureau of European Affairs
(613) 992-4815

P.T. Eastham
Director General
Office of U.S. Relations
(613) 995-7119

Department of External Affairs
International Bureaux
235 Queen Street
Ottawa, Ontario
K1A OH5

DEPARTMENT OF EXTERNAL AFFAIRS

PROGRAM FOR EXPORT MARKET DEVELOPMENT (PEMD)

This program is administered by the PEMD Branch within External Affairs. It was established in 1971 to encourage and assist established Canadian suppliers of goods and services to enter new export markets or to undertake additional development activities. The program makes provision for contributions of up to 50% of the cost of entering into new markets. Contributions are repayable if sales are achieved.

Solar exporters or would-be exporters should always make their first point of contact the nearest regional office of the Department of Regional Industrial Expansion. Here application forms and more detailed information on project eligibility can be obtained. Many applications are approved at the regional level. Most requests however, are evaluated by the Construction and Consulting Services Branch of the Department. This Branch keeps files on most solar manufacturers and it is their assessment of the industry and individual firms which is critically important in achieving success in the PEMD Program. The eligibility criteria for each section should be noted carefully. The PEMD Program is divided into six sections (A-F) designed to meet the maturing needs of exporters. Company eligibility requirements are identical for Sections A to D and are listed below. Additional eligibility requirements for Sections E and F are listed under those sections. Project eligibility is often similar but has been spelled out under each section individually.

APPLICANT ELIGIBILITY

Incorporated firms or partnerships or groups of such firms or incorporated firms of professionals or groups of them who are recognized and controlled by government regulation.

The applicant organization must also satisfy the following criteria:

1. be established and operating in Canada

2. have sufficient operational experience to demonstrate that it has the ability or potential for competitive performance in foreign markets for the products or services concerned

3. have sound managerial and financial capability with positive net worth and working capital

For more information about PEMD Program Sections A-F contact the nearest regional office of the Department of Regional Industrial Expansion. See page 26.

SECTION A: SPECIFIC PROJECT BIDDING

OBJECTIVES

To provide a financial contribution to companies towards the cost of a pre-contractual bid/proposal on a specific project. The term "specific project" describes those projects which require a bid/proposal procedure to obtain a contract for the provision of one or more of the following:

1. Consulting services
2. Engineering
3. Construction
4. Supply of equipment
5. Supply of other products and services

It might be pointed out that if more than one Canadian firm is competing for the same work, assistance is not normally provided.

TYPES OF ASSISTANCE AVAILABLE

Assistance toward an approved project consists of sharing the costs of personnel, transportation and other expenses incurred after the "effective date" of the application (i.e. the date the department received the completed application).

Assistance may include:

1. Personnel costs:

   Daily allowances ($100 per day in Canada, $150 per day outside Canada) for qualified company personnel working full time on the project.

2. Transportation costs:

   50% of a return economy airfare or equivalent transportation cost to the farthest point on an approved itinerary.

3. Special related costs:

   50% of costs demonstrated as being necessary and having a direct bearing on the success of the project.

PROJECT ELIGIBILITY

To be eligible for PEMD assistance, an applicant must demonstrate that:

1. The project is specific concerning the products, services and region and requires a bidding/proposing procedure to obtain a contract.

2. Competent Canadian sources and capabilities exist for goods and services involved.

3. The contract would not likely be pursued without PEMD assistance.

4. There is a reasonable probability of obtaining the contract.

5. The contract, if won, would provide a significant net benefit to Canada.

Applications will only be considered when the requested contribution is $1,000 or more.

SECTION B: MARKET IDENTIFICATION TRIPS

OBJECTIVE

To assist in the exploration of new markets for Canadian goods and services.

TYPES OF ASSISTANCE AVAILABLE

Under Section B the following may be provided:

1. Personnel Costs:

   A daily allowance of $150 while abroad for a maximum of two full-time employees.

2. Transportation Costs:

   50% of a return economy air fare or equivalent transportation cost to the furthest point on and approved itinerary.

PROJECT ELIGIBILITY

To be eligible for PEMD support, a proposed project must:

1. Involve a geographical area that is new to the applicant or introduce a line of goods and services new to a market area; for Trade Fairs, second and third participation may be allowed in order to ensure the applicant becomes established in this market.

2. Apply to goods and services available from existing Canadian sources and capabilities.

3. Be unlikely to take place without PEMD assistance.

4. Have significant Canadian content.

5. Have a reasonable probability of success.

6. Make good business sense relative to its cost, the company's financial position and the expected benefits.

Note: Missions and trade fair participation, sponsored by other federal or provincial agencies are not eligible.

SECTION C: PARTICIPATION IN TRADE FAIRS ABROAD

OBJECTIVE

To encourage a firm's participation in trade fairs where effective penetration of new markets is likely to result.

TYPES OF ASSISTANCE AVAILABLE

Under Section C the following may be provided:

1. Personnel Costs:

   A daily allowance of $150 for a maximum of two full-time employees attending the trade fair. Eligible days are calculated as follows: number of days the fair is open, one day setting up and one day to dismantle display plus two days travel.

2. Transportation Costs:

   50% of a return economy air fare or equivalent transportation to the trade fair.

3. Trade Fair Costs:

   50% of the following show-related costs, if incurred, may be reimbursed

   (a) space rental

   (b) building of display if done by professional firm else 150% of material costs (up to $3000) if done in-house

   (c) ancillary display costs:
   - (i) electrical hook ups, furniture
   - (ii) transportation costs
   - (iii) insurance
   - (iv) erection and dismantling
   - (v) special promotional material for show up to $1000.

PROJECT ELIGIBILITY

See Section B

SECTION D: INVITATIONS TO INCOMING BUYERS

OBJECTIVE

To share the cost of bringing foreign business or government officials, who influence purchasing decisions of their organizations, to Canada or to an approved location abroad.

TYPES OF ASSISTANCE AVAILABLE

Under Section D the following may be provided

1. Personnel Costs:

   A daily allowance of $150 for each business day the incoming buyer is with the host firm plus two days travel.

2. Transportation Costs:

   50% of the incoming buyer's return economy air fare to the farthest point on the agreed itinerary.

PROJECT ELIGIBILITY:

See Section B

SECTION E: EXPORT CONSORTIUM ASSISTANCE

OBJECTIVE

To provide an incentive for small and medium sized companies to form export consortiums on a permanent and continuing basis. Such consortiums must seek to combine and improve export capabilities over and above the abilities of the individual firms.

APPLICANT ELIGIBILITY

The proposed consortium must be composed of three or more established Canadian manufacturers having like or complementary products.

While the program is geared for manufacturers, a service and/or consulting firm may be included if the reviewer feels its participation is essential to the success of the consortium as a whole.

These companies must also meet eligibility criteria as set down in Section A.

TYPES OF ASSISTANCE AVAILABLE

Phase I - Feasibility Study

This phase is administered by Regional Offices. It provides for a detailed study to determine the compatability of the proposed members of the consortium and their product lines and the viability of their export market plan.

1. The lessor of 50% of direct salaries or a fixed per diem allowance for each per professional and management staff person.

2. 50% of travel costs including the return economy air fare to points outside Canada, but not the costs for travel between two points in Canada.

The maximum PEMD contribution under Phase I is $25,000 or 50% of eligible costs, whichever is the less.

At the end of Phase I the applicant must present a final report to the regional office of the Department of Regional Industrial Expansion including a comprehensive marketing penetration plan for sustained activity in the market. Approved plans are eligible for assistance under Phase II.

Phase II

This phase is administered by Head Office. It helps several firms to share the cost of establishing and operating a group marketing organization in Canada to achieve sales abroad. Funds are provided for a maximum of three years or until the agreed level of sales is attained.

1. The lessor of 50% of the direct salaries or a fixed per diem allowance for each professional and management staff person (the cost of Canadian based staff has limited eligibility).

2. 50% of travel costs including the return economy air fare to points outside Canada, but not costs for travel between points in Canada.

3. 50% of the special costs to develop and implement the Market Penetration Plan. e.g. establishing and operating a sales office including rent, travel and promotional aids, etc.

PROJECT ELIGIBILITY

To be eligible for PEMD support, an applicant must demonstrate that:

1. The proposed project has a reasonable probability of success.

2. The project is likely to result in significant net benefit to Canada.

3. The project would not likely be pursued without PEMD assistance.

SECTION F: ESTABLISHMENT OF FACILITIES ABROAD FOR SUSTAINED ACTIVITY IN A PARTICULAR EXPORT MARKET

OBJECTIVE

To provide assistance to Canadian exporters who wish to undertake a sustained marketing effort in a foreign market by establishing facilities on location. This section of PEMD is not intended to support applicants with no previous exporting experience.

APPLICANT ELIGIBILITY

The applicant organization must meet the following eligibility criteria:

1. Be currently established and operating in Canada

2. Have sufficient operational experience to demonstrate an established capability and capacity to provide the products and services successfully in the target market.

3. Have satisfactory marketing and management capabilities

4. Have a record of successful financial performance and adequate financial resources to successfully carry out the sustained export marketing effort.

5. Must be an incorporated business or partnership of businesses, firms of professionals or partnerships of such firms.

TYPES OF ASSISTANCE AVAILABLE

Phase I - Market Study

This phase is administered by Regional Offices. It provides for a detailed study on establishing sustained marketing facilities in a particular export market and development of a proposal for implementing that plan.

1. The lessor of 50% of direct salaries or a fixed per diem allowance for each professional and management staff person.

2. 50% of travel costs including the return economy air fare to points outside Canada, but not the costs for travel between two points in Canada.

The maximum PEMD contribution under Phase I is $25,000 or 50% of elgibile costs, whichever is the less.

At the end of Phase I the applicant must present a final report to the regional office of the Department of Regional Industrial Expansion including a comprehensive Market Penetration Plan for sustained activity in the market. Approved plans are eligible for assistance under Phase II.

Phase II

This phase is administered by Head Office. It covers the implementation of the market penetration plan for a maximum of three years or until the agreed level of sales is attained.

1. The lesser of 50% of the direct salaries or a fixed per diem allowance for each professional and managmenent staff person (the cost of Canadian based staff has limited eligibility).

2. 50% of travel costs including the return economy air fare to points outside Canada, but not costs for travel between points in Canada.

3. 50% of the special costs to develop and implement the Market Penetration Plan e.g. establishing and operating sales and service facilities abroad including rents,local travel, promotional aids but <u>not</u> capital costs for building acquisition or production costs.

PROJECT ELIGIBILITY

In considering an application for assistance, PEMD also takes the following criteria into account:

1. The previous experience of the firm in this market, and the current level of Canadian exports of the proposed product or services to this market.

2. Whether the proposed project has a reasonable probability of success.

3. Whether the project is likely to be of substantial benefit to Canada.

4. Whether PEMD support is necessary for the project's implementation.

DEPARTMENT OF EXTERNAL AFFAIRS

PROMOTIONAL PROJECTS PROGRAM (PPP)

This program is administered by the Fairs and Missions Policy and Coordination Division within the Marketing Planning, Policy and Evaluation Group of the Department of External Affairs. Projects in specific geographic markets are implemented by the relevant Office of Trade Development. Unlike the PEMD Program where companies apply for direct support, initiatives are taken in this case by the Canadian government and companies are invited to participate.

OBJECTIVES

To assist export development though trade promotion in three general categories:

1. Trade Fairs outside Canada
2. Trade Missions to Foreign Markets
3. Incoming Trade Missions and Visitors

GENERAL APPLICANT ELIGIBILITY

Incorporated firms or partnerships or groups of such firms or an incorporated firm of professionals or a group of them who are controlled by government regulation. The applicant organization must also satisfy the following criteria:

1. be established and operating in Canada

2. have sufficient operational experience to demonstrate that it has the ability or potential for competitive performance in foreign markets for the products or services concerned

3. registration with the Business Opportunities Sourcing System (BOSS). See page 31. (since this program is government initiated, solar manufacturers must be registered with R.I.A.'s BOSS)

TRADE FAIRS, MISSIONS ELIGIBILITY

The decision on which companies are invited to participate in PPP projects is made (in the case of solar companies) by the Construction and Consulting Services Branch of R.I.E. in consultation with the Trade Commissioner Service, the Office of Trade Development and to some extent the industry itself.

TYPES OF ASSISTANCE AVAILABLE

1. Trade Fairs Outside Canada

   The government organizes participation by Canadian firms in national exhibits, manages the exhibits and pays for the design, construction, erection and operation of the shows including the cost of shipping unsold products back to Canada. Each participant pays a nominal deposit which is refunded after the event. Exhibits must be staffed by competent company representatives who have the mandate to quote prices and carry out contractual negotiations. Technical and sales literature (costs covered) should be available in the language of the host country.

2. Trade Missions

   The government organizes outgoing missions, provides project management and pays travel costs of participants of trade missions. Travel costs include transportation, hotels, hospitality, interpretors and other related costs.

3. Trade Visitors

   The government sponsors incoming missions and pays travel and living costs of mission members.

For more information about PPP contact:

The nearest Regional Office of the Department of Regional Industrial Expansion. See page 26.

DEPARTMENT OF REGIONAL INDUSTRIAL EXPANSION

REGIONAL OFFICES

The eleven Regional Offices of the Department provide the initial contact point for exporters with Canadian government export services. The Regional Offices work closely with the International Bureaux and Trade Commissioner Service of External Affairs, the Products and Programs Branches of R.I.E. and other government departments.

OBJECTIVES

1. Advise on all aspects of exporting.

2. Facilitate contacts with various agencies both in Canada and abroad.

TYPES OF SERVICES AVAILABLE

The Regional Offices are equipped to handle routine enquiries about the export of products and market opportunities in most countries. Offices have full access to Government of Canada exporting services. Briefly, regional officers can aid exporters in the following ways:

1. assist in the design and implementation of marketing plans

2. help in location and evaluation of new markets and expanding existing ones

3. assist in explaining government programs and services that might be available including opportunities for trade fairs, missions and in-store promotion

4. counselling on pricing, documentation, tariffs, labelling, and modes of transportation as well as on financing and insurance abroad

5. provide detailed knowledge of current regulations on export and import controls

6. help identify licensing and joint venture opportunities abroad

7. distribute Canada Commerce, a periodical which contains reports on business conditions, trading methods and trade opportunities in other countries.

Also obtainable by writing to:

Canada Commerce (98)
Department of Regional Industrial Expansion
Ottawa, Ontario
K1A 0H5
(613) 995-8900 Ext. 53

APPLICANT ELIGIBILITY

The services of the Regional Offices are available to all exporters or potential exporters.

For more information, contact the nearest Regional Office listed below:

Alberta and Northwest Territories Region
500 Macdonald Place
9939 Jasper Avenue
Edmonton, Alberta
T5J 2W8
(403) 425-6330

British Columbia and Yukon Region
Suite 2743
P.O. Box 49178
Bentall Centre, Tower III
595 Burrard Street
Vancouver, B.C.
V7X 1K8
(604) 666-1434

Manitoba Region
507 Manulife House
386 Broadway Avenue
Winnipeg, Manitoba
R3C 3R6
(204) 949-2381

New Brunswick Region
Suite 642
440 King Street
Fredericton, N.B.
E3B 5H8
(506) 452-3190

Newfoundland Region
127 Water Street
2nd Floor
P.O. Box 6148
St. John's, Newfoundland
A1C 5X8
(709) 737-5511

Nova Scotia Region
Suite 1124, Duke Tower
5251 Duke Street
Scotia Square
Halifax, Nova Scotia
B3J 1N9
(902) 426-7540

Ontario Region
First Canadian Place
Suite 4840, P.O. Box 98
Toronto, Ontario
M5X 1B1
(416) 369-4951

Prince Edward Island Region
Dominion Building
987 Queen Street
P.O. Box 2289
Charlottetown, P.E.I.
C1A 8C1
(902) 892-1211

Quebec City Office
Suite 620
2 Place Quebec
Quebec, Quebec
G1R 2B5
(418) 694-4726

Quebec Region
P.O. Box 1270, Station B
Suite 600
685 Cathcart Street
Montreal, Quebec
H3B 3K9
(514) 283-6254

Saskatchewan Region
980-2002 Victoria Avenue
Regina, Saskatchewan
S4P 0R7
(306) 569-5020

DEPARTMENT OF REGIONAL INDUSTRIAL EXPANSION

CONSTRUCTION AND CONSULTING SERVICES BRANCH

This Branch is administered by the Department of Regional Industrial Expansion. Solar products manufacturers fall within this Branch because most technological applications require construction. Within this Branch are officers knowledgeable on the solar industry who provide advice to the Department of External Affairs and other government departments on policy matters related to solar.

OBJECTIVES

To offer special assistance to Canadian manufacturing (in this case solar manufacturers) industries to help them achieve increased productivity and international competitiveness.

TYPES OF SERVICES AVAILABLE

1. To provide liaison between industry and government.

2. To provide assistance relating to technology, marketing, financing, research and development and management.

3. In co-operation with the International Bureaux and Trade Commissioner Service, develop regional trade strategies for products/industry sectors to enable Canadian industry to develop and expand its export potential.

APPLICANT ELIGIBILITY

Any solar manufacturer/installer/consultant is eligible for assistance from the Branch. The Branch tries to maintain a thorough knowledge of financial, technological and marketing factors affecting the industry. This information is continually analyzed to identify both the constraints and opportunities facing the industry. Theoretically this allows for planning to minimize constraints and maximize opportunities.

As explained when discussing the Trade Commissioner Service, one does not "apply" to the Construction and Consulting Services Branch. Their assessment of a company or an industry plays a large part in the level of assistance in export marketing. This applies to PEMD, PPP and EDP Programs as well as assistance from External Affairs.

For further information contact:

John Emery
Chief
Construction Division
Construction and Consulting Services Branch
Department of Regional Industrial Expansion
235 Queen Street
Ottawa, Ontario
K1A 0H5

(613) 992-0028

DEPARTMENT OF REGIONAL INDUSTRIAL EXPANSION

BUSINESS OPPORTUNITIES SOURCING SYSTEM (BOSS)

The B.O.S.S. is a computer based product information bank which permits domestic and foreign buyers to identify Canadian sources of supply. It is administered by the Department of Regional Industrial Expansion. There are over 10,000 firms already registered.

OBJECTIVES

To aid Canadian firms (especially small and medium sized firms) to reach a wide audience of potential buyers at home and abroad.

TYPE OF SERVICE AVAILABLE

1. Company and product information is made available on microfiche and distributed to Trade Commissioner posts worldwide and R.I.E.'s Regional Offices.

2. Access to buyers in multinational firms who use the system.

3. Access to consulting firms who do a large part of their business outside Canada.

APPLICANT ELIGIBILITY

Canadian companies currently established in export sales or seriously interested in developing export markets are advised to complete the B.O.S.S. questionnaire.

For more information contact:

See list of Regional Offices of the Department of Regional Industrial Expansion on page 26.

DEPARTMENT OF REGIONAL INDUSTRIAL EXPANSION

ENTERPRISE DEVELOPMENT PROGRAM (EDP)

This program is administered by the General Program Management Division of the Programs Branch. Applications for assistance may be made through the Department's regional offices or to the Programs Branch. Approvals are made by a Regional Board or by the Central Enterprise Development Board depending on the size of the company and the amount of funds to be approved. Please see comments about the PEMD Program.

OBJECTIVES

To aid the growth of the manufacturing and processing sectors of the Canadian economy by providing assistance to selected firms to make them more viable and internationally competitive. This is to be achieved by fostering innovation in design and development of new or improved products or processes and to assist adjustment to changing competitive circumstances.

The program focuses on promising small and medium-sized firms prepared to undertake relatively high risk projects which are viable and promise attractive rates of return.

TYPES OF ASSISTANCE AVAILABLE

The EDP can make a contribution in the form of a grant of up to 75% of the eligible costs for the following projects:

1. Development of Proposal for Projects Eligible for Assistance

   To ensure that the more complex proposals for innovation and adjustment assistance are developed on a viable, adequately researched and workable basis, grants can be provided to partially offset the cost of qualified consultants.

2. Identification of New Products

   To encourage the identification and development of new products, grants can be provided to share the cost of qualified consultants engaged to identify new products through the research of product user requirements and to undertake related product and market testing.

3. Product Development

To develop new or improved products and processes or service capability incorporating an advance in technology and offering good prospects for profitable commercial exploitation. Rights to the technology are vested in the company but the exploitation of the project must be undertaken in Canada.

4. Product Design

To share in the cost of integrating the needs of the user in Canada or elsewhere into the design of new or improved products. Such projects normally relate to durable products that are mass-produced by industrial processes.

5. Feasbility Studies for Productivity Improvements

To encourage feasibility studies by qualified consultants of productivity improvement measures new to a firm which involve some risk to it.

The EDP also provides:

6. Loan Assistance for Adjustment Projects

To facilitate restructuring or rationalization of manufacturing and processing firms in Canada, to enhance the viability of secondary manufacturing and processing and to permit Canadian firms to become more internationally competitive, EDP provides insurance for 90% of a term loan used to finance specific projects to facilitate gaining funds from conventional lenders on reasonable terms and conditions. This loan insurance is offered for a 1% annual fee.

APPLICANT ELIGIBILITY

1. Small and medium-sized firms engaged in manufacturing or processing activities. Also, in some circumstances, firms in the service sector.

2. The firm must be established and operating in Canada.

3. The firm must have sufficient operational experience to demonstrate that it has the ability or potential for competitive performance in foreign markets for the product(s) concerned.

4. The firm must have sound managerial and financial capability with positive net worth and working capital.

5. Firms applying for product development or design assistance must be incorporated. Incorporation is not a requirement for adjustment assistance.

6. The applicant must demonstrate that the project represents a significant burden to the firm to obtain grant assistance.

PROJECT ELIGIBILITY

Each form of assistance has certain eligibility criteria but in general each project must be technically feasible and commercially viable. Product development grants must demonstrate a technical advance and represent technical risk.

For more information about the EDP contact:

The nearest regional office of the Department of Regional Industrial Expansion. See page 26.

INTERNATIONAL DEVELOPMENT RESEARCH CENTRE (IDRC)

The IDRC, a public corporation was established in 1970 to initiate, encourage, support and conduct research into the problems of the developing regions of the world and into the means for applying and adapting scientific, technical and other knowledge to the economic and social advancement of those regions.

The centre was created as a public corporation to allow it the greatest possible measure of flexibility and autonomy, while still being accountable to Parliament.

Through 1981 the centre has approved support for over 1100 projects valued at $209 million.

OBJECTIVES

1. To provide support for researchers living and working in developing regions.

2. To fund research to promote the well-being of the rural poor of the semi-arid tropics.

3. To seek to link Canadian research and development capacity in cooperative programs with developing countries to find solutions to developing country problems. (Sub-objective).

SUPPORT FOR ENERGY RESEARCH

Since 1970 the centre's four program divisions have responded significantly to requests for support of projects involving energy research. Some 50 projects, totalling about $7 million, have been undertaken in Africa, the Middle East, Asia, Latin America, the Pacific, and Canada. Projects supported in developing countries include rural energy surveys, national energy policies, technology assessment, fuelwood lots, biogas generation, and design of small-scale post-harvest technologies incorporating solar and wind energy. The solar applications have been in the area of solar thermal crop-drying as follows:

Country	Crop(s)	Project Funding
Egypt	Fruit Vegetables Fish	$285,400
Niger	Onions	80,700
Thailand	Rice	162,000
Sierra Leone	Rice	46,800
	TOTAL	$574,900

As a result of a four-year $10 million allocation from Parliament as part of Prime Minister Trudeau's Nairobi commitment (see also CIDA programs), IDRC has plans for an expanded program of energy research in third world countries.

EXPANDED ENERGY RESEARCH PROGRAM

OBJECTIVES

To provide an expanded program of support for energy research in third world countries. Emphasis will be placed on:

1. research to define energy problems
2. research to identify and evaluate energy technologies
3. energy planning

PROGRAM COMPONENTS

1. Creation of an Energy Research Group (ERG)
   This group will be composed of eminent researchers and policy makers from the less developed countries. They will review needs, priorities and resources. They will be an independent source of information in assisting developing countries and donors in making critical decisions involving their energy options.

2. Increased suport to IDRC'S four program divisions.
   This will mean additional research projects in:

   (a) forestry
   (b) fuel-related aspects of post-harvest agricultural production technologies (eg. solar drying)
   (c) developing countries energy policies and their energy information requirements
   (d) joint Canadian-Third World energy development technology studies

3. Strengthen communications between donor agencies active in energy research. This will be done by more informal meetings of donors and publishing results of ERG studies.

APPLICATIONS TO SOLAR MANUFACTURERS

IDRC is a research oriented agency with no commitment to aid Canadian business. There is no doubt though that IDRC's solar energy research carried out through its projects could provide additional information to would-be solar exporters, especially in the area of rural applications in some countries. Realistically, however, applications of simple solar technologies in agricultural areas, even if they were found to be financially viable could never lead to large export sales. The solar thermal technology (for crop drying) would have to be very simple and thus easily copied. It is doubtful that even joint-ventures or licensing would be feasible. Research oriented companies would perhaps have the most interest in IDRC energy plans especially joint research studies. Interested solar manufacturers, researchers or consultants should contact IDRC through:

Mr. Ed Weber
Associate Director
Post Production Systems
International Development Research Centre
60 Queen Street
Ottawa, Ontario
K1G 3H9
(613) 996-2321

EXPORT DEVELOPMENT CORPORATION (E.D.C.)

The Export Development Corporation is a Crown Corporation owned by the Government of Canada. It operates on a commercial basis. From its initial financial commitments of $50 million in 1945, it has grown and diversified its facilities and services and currently assumes outstanding liabilities in excess of $25 billion.

OBJECTIVES

To facilitate and expand Canadian export trade by providing credit and investment insurance, guarantees, loans and other services to exporters competing internationally. EDC gets involved when services are not normally provided by the private sector. It endeavours to place exporters (in terms of credit) in a position of competitive equality with exporters in other countries who have access to similar services that it offers. These services are generally available to most Canadian incorporated business. Please see section on eligibility for more details.

TYPES OF SERVICES AVAILABLE

1. Global Insurance Services

   These services are designed to protect the exporter against non-payment by foreign buyers for certain economic or political reasons. EDC coverage reduces the risk in granting credit to foreign buyers and fears of serious drains on working capital tied up in bad debts and overdue accounts.

There are 3 types of Global Insurance offered:

(a) Global Shipments Insurance:
Covers exporter from time of shipment until payment is secured (mostly for off the shelf items)

(b) Global Contracts Insurance:
Covers exporter from time order made until payment is received. (For items manufactured to buyer's specifications)

(c) Global Services Insurance:
Covers a service contact from period the services are performed until payment is received.

EDC assumes up to 90%of the risk of non-payment with the exporter making up the difference.

2. Loans

EDC arranges and guarantees long-term loans to buyers of capital equipment and/or technical services from Canada. Working in conjunction with the Canadian banking community, the Corporation provides terms which are as internationally competitive as possible. Usually the Canadian exporter submits the loan application to EDC on behalf of the foreign buyer, and funds are disbursed directly to Canadian suppliers on behalf of the borrower.

Lines of credit extended in a number of countries also open the door for Canadian firms to bid on foreign projects, assuring them that financing arrangements will support their commercial sales.

Eligible transactions must have the highest possible Canadian material/labour content. There are minimum standards in this regard.

3. Foreign Investment Insurance

EDC insures Canadian investors against loss of their investments abroad. Coverage includes three broad political risks.

(a) inconvertibility on inability to repatriate earnings or capital
(b) expropriation
(c) war or revolution

This type of insurance enables Canadian companies to enter foreign markets more confidently through joint ventures, management contacts and various technical service contracts.

Investments may vary from that of the investor acquiring the right to share in the assets and profits of a foreign business to loans to a person in a foreign country for purposes of establishing a business. The period of coverage is restricted to a maximum of 15 years. EDC requires the investor to assume a percentage of the risk (normally 15%). Contracts do not cover risks that can be normally insured with commercial insurers.

This type of insurance is designed only for new investments overseas. It is intended to place Canadian investors in positions of competitive equality with nationals of other countries that have similar schemes, and thus help maintain or enhance Canada's trade position.

4. SURETY INSURANCE

EDC surety insurance provides bonds and guarantees to Canadian exporters, banks, surety companies, etc. to offset many of the major risks involved with issuance of performance bonds or guarantees in export transactions. Surety insurance complements EDC's existing services in four ways.

(a) Performance Security Guarantee: Insures a Canadian bank or financial institution for 100% of risk against a call on performance bond.

(b) Performance Security Insurance: Insures an exporter up to 90% against wrongful call of his bond by a buyer.

(c) Consortium Insurance: Provides cross-consortium liability insurance to members of a limited liability exporting consortium.

(d) Surety Bond Insurance: Insures up to 70% of the face value of certain performance bonds to foreign buyers.

This insurance may also be provided to construction projects which do not normally meet EDC operating criteria because of the substantial portion of local costs involved. In assessing a satisfactory Canadian content in such cases, EDC takes both tangible and intangible factors (eg. Canada's reputation abroad) into consideration.

APPLICANT ELIGIBILITY

The range of services provided by the EDC is quite extensive. Some eligibility critera are common to most Services, a few are specific to one or two. The exporter is advised to contact nearest EDC regional office below for more information about his own particular situation and needs.

By and large the following rules would apply in most situations:

1. The facilities provided by EDC are not intended to subsidize exporters. To be eligible Canadian firms must compete in export markets on the basis of having a competitive product in terms of:

   (a) price
   (b) quality
   (c) service
   (d) delivery

2. Any incorporated individual, partnership, firm or consortium operating a business in Canada and exporting or wishing to export goods or services from Canada.

3. There are minimum standards for Canadian labour/ material content (60%). Those transactions which involve a high degree of Canadian content are more likely to be eligible for EDC support.

4. EDC, out of economic necessity, is set up to provide financing services to larger companies exporting in more mature markets.

   There has been some concern in small business circles about the amount of support from EDC. The general small nature of most solar projects or solar export contracts could mean that financing packages especially in poverty stricken Third World countries may be difficult to negotiate.

For further information about EDC's operations and services exporters initial contact should be EDC's nearest regional office:

The Atlantic Office
Export Development Corporation
Suite 1401, T.D. Bank Building
1791 Barrington St.
Halifax, N.S.
B3J 3L1
(902) 429-0426

The Quebec Region
Export Development Corporation
Suite 2724, 800 Victoria Square
P.O. Box 124
Tour de la Bourse Postal Station
Montreal, Quebec
H4Z 1C3
(514) 878-1881

The Ontario Region
Export Development Corporation
Suite 2600, P.O. Box 64
One First Canadian Place
Toronto, Ontario
M5X 1B1
(416) 364-0135

The Western Region
Export Development Corporation
Suite 1030, One Bentall Centre
505 Burrard St
Vancouver, B.C.
V7X 1M5
(604) 688-8658

CANADIAN COMMERCIAL CORPORATION (CCC)

The Canadian Commercial Corporation, a crown corporation was established in 1946 to "assist in the development of trade between Canada and other nations". Since that time it has helped Canadian firms obtain over $10 billion in export orders from 90 foreign governments. In recent years the CCC has helped over 400 firms obtain government contracts. Some of the contracts are linked to Canadian aid projects in less developed countries and are financed by CIDA.

The CCC acts as prime contractor with the foreign government and sub-contracts with Canadian suppliers. It works closely with External Affairs, EDC, CIDA and provincial governments. Contracts arranged by CCC range from individual items of a few thousand dollars to capital projects of $50 million. Many contracts involve high technology equipment and systems. Total annual export sales is over $300 million.

OBJECTIVES

To assist in the development of trade between Canada and foreign governments and international agencies in the areas of:

1. Prime contractor in supplying Canadian products and services overseas.

2. Packager and catalyst in the export of Canadian capital projects.

TYPES OF SERVICES AVAILABLE

1. Helping foreign customers find Canadian sources of goods and services and developing bid opportunities for Canadian suppliers.

2. Contracting with foreign governments and international agencies on behalf of Canadian suppliers. CCC also acts as the prime contractor on government to government arrangements with a commitment to deliver a product, service or project package to a foreign government, with a back to back obligation from a Canadian supplier.

3. To provide export-facilitating services to Canadian firms such as:

   (a) inspection and acceptance
   (b) shipping services
   (c) paying suppliers and collecting from customers

APPLICANT ELIGIBILITY

COMMERCIAL AND DEFENCE-RELATED SALES

The CCC receives about 10,000 enquiries each year from over 50 foreign governments and international agencies relating to requirements for individual commercial and defence related goods and services.

Through an arrangement made between the CCC and DSS, these contracts are transacted in the Corporation's name, by the specialized staff of the Export Supply Directorate and the Department's Product Centres.

Solar manufacturers not listed with DSS are at an obvious disadvantage in bidding on the supply of products/services to CCC.

CAPITAL PROJECTS AND MULTI-ITEM ACQUISITIONS

CCC serves as prime contractor in capital projects when a government to government arrangement meets the needs of, and is requested by, foreign customers and interested Canadian firms.

Identification of projects involving foreign governments (or multilateral agencies) is made for CCC by the Trade Commissioner overseas who relays the information to appropriate desk officers in the International Bureaux would feed the project information to CCC. If a government to government approach seems appropriate the International Bureaux would feed the project information to CCC. This occurance is uncommon. Usually the information is fed to industry through the Boss listings. Sometimes it is industry itself which hears about bid opportunities. In any case it is usually industry who comes to CCC for assistance.

In capital project activities with CCC, Canadian manufacturers, engineering consultants, as well as contruction and/or project management firms, participate as members of consortia or as lead contractors and are responsible for project management and operations.

Capital projects are trasacted by CCC's head office staff.

CANADIAN BIDS IN MULTILATERALLY FINANCED PROJECTS OVERSEAS

Multilateral project opportunities are identified by the Trade Commissioners overseas. CCC will obtain selected bid documents from the implementing agencies and through the Export Supply Directorate solicits bids from potential Canadian suppliers.

Bids received are consolidated and submitted as a tender to the responsible agency. This activity is only carried out when Canadian firms are not bidding directly.

CCC is involvement in the process is especially useful when the resources of several Canadian suppliers are required to complete a bid package, or where savings may be realized in bonding, packaging, shipping and insurance costs.

Those solar companies which might sell to CCC or a foreign government will need not only a good product at a competitive price but be prepared to spend time and energy in letting various buyers, at home and abroad, know about their company and products. This will also necessitate the company (or group of companies) to tie into their own foreign projects information network (see Multilateral Agencies).

For more information on item procurement contact:

Mr. O.T. Matthews
Director General
Export Supply Centre
Department of Supply and Services
Science and Engineering Procurement
Place du Portage, Phase 3
11 Laurier St.
Hull, Québec
Tel: (819) 997-5714

For more information on capital projects overseas contact:

Nigel Thompson
Canadian Commercial Corporation
17th Floor
Tower B, Place de Ville
Ottawa, Ontario
K1A 1E9
Tel: (613) 996-0034

ONTARIO MINISTRY OF INDUSTRY AND TRADE

ONTARIO FIELD OFFICES

The Ministry maintains eighteen (18) field offices to provide exporters with an initial contact with Ontario Government export services. The field offices work closely with headquarters operations and the various Ontario Development Corporations.

Initial contacts with the Ontario Government should be with the field offices. Ontario Government export policy in general is designed to supplement the programs and services provided by the Federal Government. Solar exporters should keep this in mind when approaching the provincial government.

CONTACT

For more information, contact the nearest Field Office listed below:

Brockville

143 Parkedale Avenue
Brockville, Ontario
K6V 6B2
(613) 342-5522

Hamilton

119 King Street West
P.O. Box 2112
Hamilton, Ontario
L8N 3Z9
(416) 521-7783

Kingston

Suite 308
1055 Princess Street
Kingston, Ontario
K7L 5T3
(613) 547-2248

Kitchener

Suite 507
305 King Street West
Kitchener, Ontario
N2G 1B9
(519) 744-6391

London

Suite 607
195 Dufferin Avenue
London, Ontario
N6A 1K7
(519) 433-8105

North Bay

Northgate Plaza
1500 Fisher Street
North Bay, Ontario
P1B 2H3
(705) 472-9660

Orillia

2nd Floor
Sterling Trust Building
73 Mississaga Street East
P.O. Box 488
Orillia, Ontario
L3V 6K2
(705) 325-1363

Ottawa

Suite 404
56 Sparks Street
Ottawa, Ontario
K1P 5A9
(613) 566-3703

Owen Sound

Suite 104
Nor-Towne Plaza
1131 Second Avenue East
Owen Sound, Ontario
N4K 2J1
(519) 376-3875

Peel

6th Floor
201 City Centre Drive
Mississauga, Ontario
L5B 2T4
(416) 279-6515

Peterborough

139 George Street North
Peterborough, Ontario
K9J 3G6
(705) 742-3459

Sault Ste. Marie

120 Huron Street
Sault Ste. Marie, Ontario
P6A 1P8
(705) 253-1103

St. Catharines

Suite 401
15 Church Street
St. Catharines, Ontario
L2R 3B5
(416) 684-2345

Sudbury

4th Floor
Ontario Government Bldg.
199 Larch Street
Sudbury, Ontario
P3E 5P9
(705) 675-4330

Thunder Bay

Ontario Government Bldg.
435 James Street South
P.O. Box 5000
Thunder Bay, Ontario
P7C 5G6
(807) 475-1325

Timmins

273 Third Avenue
Timmins, Ontario
P4N 1E2
(705) 264-5393

Toronto

Suite 480
5 Fairview Mall Drive
Willowdale, Ontario
M2J 2Z1
(416) 491-7680

Windsor

Room 227
Ontario Government Bldg.
250 Windsor Avenue
Windsor, Ontario
N9A 6V9
(519) 252-3475

ONTARIO MINISTRY OF INDUSTRY AND TRADE

TRADE DEVELOPMENT PROGRAM

The Trade Development Program is administered by the International Trade and Investment Branch of the Ontario Ministry of Industry and Trade.

OBJECTIVES

To develop the manufacturing and related industries in Ontario by providing services to enhance their ability to sell their products outside Canada.

TYPES OF SERVICES AVAILABLE

1. Marketing and Export Advice

a) Market Consultants

International Market Consultants have detailed knowledge about exporting in major markets abroad. They can assist exporters in developing a market plan based on their products, capabilities and interests. They offer advice on use of agents, distributors, local offices, trade shows, and help you to assess costs and financing alternatives.

b) Market Data

Market consultants have access to a wide variety of published information about specific markets and products. The branch also publishes Exporting Made Easier, a valuable guide to services available from public and private organizations interested in exports. The Ministry also publishes The Market Place which provides details on foreign buyers, agents, and distributors who are looking for Ontario firms for business ventures.

c) International Offices

The Ontario government maintains offices in key export areas. Staff filters information about export opportunities to the branch's marketing consultants. They also provide contacts and make arrangements in much the same way as Canadian Trade Commissioners. There are Ontario offices in New York, Atlanta, Dallas, Chicago and Los Angeles in the United States as well as London, Paris, Frankfurt, Brussels, Tokyo and Hong Kong.

d) Export Seminars

Export seminars are held across the province on a regular basis. They are aimed at upgrading business marketing skills and export techniques.

2. Trade Missions/Fairs

a) Trade Missions

The Ministry organizes trade missions to what it feels are potentially lucrative markets for Ontario manufacturers/exporters. Firms get a chance to meet prospective agents, distributors and buyers in the marketplace. This is an excellent way for small businesses to make initial contacts in foreign markets.

b) International Fairs

With advice of marketing specialists potential exporters can identify and get advice on which fairs to display products. Financial assistance is provided with shipping products to the fair, renting display space and with sales promotion.

APPLICANT ELIGIBILITY

Those companies who will benefit most from the services provided under the Trade Development Program will likely have the following characteristics:

1. High Canadian content in the product, thus demonstrating benefit to the province.

2. A competitive product with demonstrated advantages over other products.

3. Human and financial resources to carry out an export initiative.

4. Be interested in marketing products in Ontario designated priority markets: the United States, key European nations, newly industrialized nations in South America, the Middle East and Africa and the Pacific Rim, particularly China, Australia and New Zealand.

Solar companies can certainly access these services. It must be borne in mind the the Ontario Government uses the

programs provided by the Federal Government wherever possible. Its own programs are designed to provide enhancement and additional support to Ontario firms. Definitive eligibility information is not available.

CONTACT

Your nearest office of the Ontario Ministry of Industry and Trade. See page 45.

ONTARIO MINISTRY OF INDUSTRY AND TRADE

INTERNATIONAL MARKETING INTERN PROGRAM

This program is administered under the BILD (Board of Industrial Leadership and Development) by the Ontario Ministry of Industry and Trade. The program is designed to assist 100 new interns each year with a maximum of one intern per company per year.

OBJECTIVES

1. To encourage exporting Ontario manufacturers to hire and train university graduates with marketing qualifications.

2. To promote export of Ontario goods and provide employment in Ontario.

TYPES OF SERVICES AVAILABLE

The government will pay 50% of the intern's salary for two years up to a maximum contribution of $15,000 per year.

APPLICANT ELIGIBILITY

Manufacturer's must satisfy the following criteria:

1. Must have a manufacturing operation in Ontario.

2. Must have the facility to train the intern in international marketing and offer employment in marketing after the program is over.

3. The applicant's training program must be challenging and provide significant work experience in foreign markets.

4. At least one solar manufacturer in Ontario has taken advantage of this program.

CONTACT

Your nearest Ontario Field Office of the Ontario Ministry of Industry and Trade. See page 45.

ONTARIO MINISTRY OF INDUSTRY AND TRADE

TRADE AIDS FOR INTERNATIONAL MARKETING (TAIM)

Administered by the International Marketing Section of the Ontario Ministry of Industry and Tourism this program is designed to assist marketing costs.

OBJECTIVES

To offer financing to help cover the marketing costs of initial export ventures.

TYPES OF ASSISTANCE AVAILABLE

Funds to help cover the costs of:

1. international promotional literature;
2. translations;
3. certification.

APPLICANT ELIGIBILITY

Those companies who will benefit most from the Trade Aids Program will have the following characteristics:

1. High Ontario content in product, thus demonstrating benefit to the province.
2. A competitive product with demonstrated advantages over other products.
3. Human and financial resources to carry out an export initiative.
4. The program is mostly designed to help exporters where the services provided by PEMD and the Promotional Projects Program are not available. The Ontario Government prefers to use its own discretion in offering assistance and eligibility criteria are rather vague.

CONTACT

Your nearest office of the Ontario Ministry of Industry and Trade. See page 45.

ONTARIO DEVELOPMENT CORPORATION

The Ontario Development Corporation is a Provincial Crown Corporation designed to aid Ontario firms with advice and support in financing new initiatives.

OBJECTIVES

To aid selective Ontario firms to break into export markets by providing financial support not available from other financial institutions for export receivables either consumer or capital goods.

TYPES OF ASSISTANCE AVAILABLE

The Corporation provides $25 million each year for financing up to 90% of export receivables in the form of a line of credit. The credit line for individual firms has a maximum ceiling of $1 million and is offered at reduced interest rates.

APPLICANT ELIGIBILITY

See the Trade Development Program. This program does not duplicate the services offered by the Export Development Corporation, the chartered banks or secondary lenders.

CONTACT

Your nearest office of the Ontario Ministry of Industry and Trade. See page 45.

ONTARIO INTERNATIONAL CORPORATION

Founded in 1980 this Crown Corporation was set up to enhance the Ontario government's role in capital projects overseas. In many ways this role is similar to the Federal Canadian Commercial Corporation.

OBJECTIVES

1. To assemble pertinent government expertise and market it internationally.

2. To help coordinate the consulting/technical package on capital projects with appropriate private sector company involvement.

3. To liaise government to government/multilateral institutions to aid private Canadian suppliers identify and take advantage of foreign capital projects.

TYPES OF SERVICES AVAILABLE

1. Advice and assistance in registration with foreign multinational agencies such as the World Bank and UN agencies so that potential Canadian bidders and foreign contracts can be sure they receive adequate notice of projects.

   To be invited to tender consulting and contracting firms must be on a lending bank's approval list. Registration is not usually required for small manufacturers.

2. In many developing countries technical knowledge is seriously lacking so that most capital projects include a training package as part of the proposal for funding. OIC can take some of the worry out of such projects by the planning, design and on-site training of local nationals as required.

3. OIC acts as a catalyst to assemble project teams to do turnkey capital projects. This is a valuable service since it allows individual firms to bid and be associated with projects that they do not have the resources either to organise or do in house.

4. Liaison with the Ontario Ministry of Industry and Trade and appropriate federal government agencies to assist in offering advice on exporting, financing and project information.

APPLICANT ELIGIBILITY

Those companies who will benefit most from OIC services will likely have the following characteristics:

1. High Ontario content in its product, thus demonstrating benefit to the province.

2. Some experience in exporting.

3. A competitive product with demonstrated advantages over other products.

4. Human and financial resources to carry out an export initiative.

CONTACT

Your nearest office of the Ontario Ministry of Industry and Trade. See page 45.

CANADIAN CHARTERED BANKS

International Trade is very important to Canada and as a result the banks have developed extensive international operations. They maintain some 300 offices in about 45 countries abroad, plus numerous resident representatives' offices and participatory affiliated bank arrangements of one type or another in many world commercial centres.

Where the banks are not directly represented they maintain functional correspondent relationships with more than 5,000 institutions virtually everywhere and some have sizeable staffs of travelling business development representatives constantly making calls.

An awareness of the growing interest in exporting is demonstrated by all the chartered banks that have established the international centre concept - a centralized facility in each region across Canada, in which is concentrated their international trade expertise.

Exporters can find out about the nearest centre from their local bank manager. Local bank branches can prepare foreign credit reports for an established charge. The international centres usually do not charge for an initial export market consultation and offer sound marketing advice to new exporters. Since their resources are limited they will refer potential exporters to the regional offices of provincial and federal agencies when it becomes necessary.

Many companies make use of trading houses and factoring companies to assist in export ventures when they have an inadequate sales force, difficulty in serving small markets or inadequate market contacts. Banks are moving into the factoring business* and generally becoming more aggressive in encouraging Canadian companies of all sizes to sell overseas.

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*Factoring houses purchase receivables and assume the risk as soon as merchandise is shipped to a foreign market. They generally lend against receivables at prime interest rates plus a percentage, so there is a fluctuating difference in the spread of rates between banks and factors. As a result, dealing with a factoring company could be more expensive. However, banks have lending limits whereas factoring companies are bound only by the amount of the receivables.

It should be noted that factoring services are not available in most Third World or Middle East countries because of difficulties in gaining credit information, lack of financial sophistication and problems in communications.

Today practically all Canadian transactions with other countries, and increasing amounts of offshore trade between Third World countries, are handled on behalf of their customers by the Canadian chartered banks.

OBJECTIVES

The main international objective of chartered banks is to provide traders with the means to settle their transactions for goods and services bought and sold and for investments.

TYPES OF SERVICES AVAILABLE

1. Export Advice

   (a) Advice, surveys and reports on market conditions, sales prospects and import and exchange regulations in Canada and abroad.

   (b) Preparation of reports and advice on the credit status of buyers and potential buyers in foreign countries.

   (c) Liaison between federal and provincial government organizations in their various assistance programs for exporters.

   (d) Advice on a financing plan that will incorporate all available assistance to the best advantage.

   (e) Advice and direction to reliable customs brokers, freight forwarders and insurance groups.

2. Financing Export Transactions

   Canadian foreign trade is financed by the chartered banks largely on a short term basis. The banks usually get involved by providing:

   (a) cash advances
   (b) commercial letters of credit
   (c) bills of exchange (documentary drafts)
   (d) inter-bank transactions (clear payments)

The letter of credit is the most common form of international payment. There are various forms which offer different conditions of payment. An exporter should get his banker to explain the significance of each.

In recent years there has been an ever-increasing demand for medium and long term financing. The banks have provided some medium-term (one to five years) financing, largely in US dollars. EDC is expanding the volume of medium term credit provided by banks through 100% unconditional guarantees. EDC is the only source for longer term financing.

3. ATA Carnet

Banks can assist in arranging through the Canadian Chamber of Commerce of an ATA Carnet to simplify customs procedures for business and professional people wishing to take commercial samples and related materials into most major countries for a temporary period. The Carnet consists of a green folder into which are incorporated a number of coloured customs sheets that allow for easy stamping and signing by customs authorities in and out of Canada and countries abroad.

4. Foreign Currency Transactions

APPLICANT ELIGIBILITY

What in fact a chartered bank will be able to do for a solar exporter will depend on the type of service being sought, the country to which goods are being exported and the credit standing of the exporter. Canadian banks can provide short term financing to solar exporters marketing in the Third World. Medium-term financing might be available with EDC unconditional guarantees. Exporters can find out more about the services that might be available to them by going to their local bank manager for more information. It should be kept in mind that domestic banks are a good place to start the search for export financing.

CONTACT

For more information about chartered bank international services contact your local bank manager for the nearest regional centre.

CANADIAN EXPORT ASSOCIATION (CEA)

The Canadian Export Association founded in 1943 is a private non-profit organization composed of about 500 companies. The CEA devotes its efforts exclusively to the interests of Canadian exporters and the service industries which cater to them.

OBJECTIVES

The CEA has two main objectives:

1. to advance the interests of Canadian exporters and others involved in export;
2. to foster the growth of exports in the interests of Canada.

For exporters this means working together effectively in a national body to seek improvements in export policies, services and facilities and freely exchange ideas on export techniques, changes and development.

TYPES OF SERVICES AVAILABLE

1. Publications

   The Association provides several monthly newsletter services designed to keep Canadian exporters up to date on international and domestic developments affecting trade. Principal among these are:

   (a) EXPORT U.S.A.: a review of changes affecting the US export market.
   (b) EXPORT DIGEST: a summary of articles on aspects of exporting and information about export opportunities.
   (c) EXPORT NEWS: a summary of CEA and various government activities in the area of exporting.

2. Day to day advice to members on individual or group problems in exporting.

3. A reference and lending library on all subjects of interest to Canadian exporters.

4. Joint sponsorship with the Canadian Bankers Association and other export interest groups of export related seminars held periodically in major centres across Canada.

5. Regular meetings for new firms to learn about techniques in exporting from more experienced operators.

6. The CEA provides a fundamental service to members by representing their interests in dealings with various levels of government.

APPLICANT ELIGIBILITY

The Services and facilities of the CEA are available to all members.

For more information contact:

Christian Sarazin
Information Officer
Canadian Export Association
Suite 250
99 Bank Street
Ottawa, Ontario
K1P 6B9
(613) 238-8888

CANADIAN MANUFACTURERS ASSOCIATION

In its over 100 years of existence the CMA always regarded the development of Canada's export trade as a prime purpose. Through the combined activities of its specialized head office service department and divisional offices across the country, the Association provides an all-embracing export service to members on the promotion, techniques and procedures of exporting.

OBJECTIVES

1. To promote Canadian manufacturing industries.
2. To further the interests of Canadian manufacturers and exporters.

TYPES OF SERVICES AVAILABLE

The CMA has an impressive list of export services through various departments that offer advice and assistance on almost every aspect of conducting exports:

1. Export Department

   (a) This department publishes circulars such as World Trade News which constantly informs exporters about export opportunities, information on new markets, changes in tariffs, documentation procedures and access conditions.
   (b) multilingual translation services
   (c) authentication of customs documents for export shipments
   (d) trade statistics
   (e) information on export procedures, techniques, markets, marketing aids and assistance programs.
   (f) sponsors export education programs

2. Legislation and Taxation

   Provides information on:

   (a) new developments in commercial law
   (b) Canadian and foreign taxation
   (c) information on trade marks, industrial designs patents and copyrights

3. Transportation Department

Provides information on:

(a) foreign rates and services of air, land and ocean carriers
(b) rules and conditions of carriage
(c) port charges
(d) packaging
(e) containerization
(f) marine insurance
(g) obligations of buyer and seller under various terms of sale used in international trade.

4. Work of the Export Committee

This committee co-ordinates the whole range of the Association's studies, services and activities in the export field. Reporting to this committee is a group of sub-committies on:

(a) tariff and non-tariff barriers
(b) export credits insurance and financing
(c) export education
(d) export promotion
(e) standards

5. Publications

Understanding Exports

Probably the best publication available to those wishing to become familiar with the business of exporting. Available from C.M.A. for $22.50, contains a series of articles by experts on various considerations in exporting including:

(a) case histories of selling products
(b) how to price for export markets
(c) converting export sales into cash
(d) foreign representation for your product
(e) transportation features of an export transaction
(f) marine insurance
(g) the importance of correct export documentation
(h) customs and shipping documents, samples of how to fill in etc.
(i) freight fowarding
(j) export trading houses
(k) business opportunities for Canadian exporters

There is also a comprehensive section on where to get assistance from federal and provincial governments and an

appendix of useful reference lists including a selection of export trading houses and bibliography of export references.

APPLICANT ELIGIBILITY

Membership in the C.M.A.

For more information contact:

Bent Larson
Manager
Service Centre
Canadian Manufacturers Association
1 Yonge Street
Toronto, Ontario
M5S 1J9
(416) 363-7261

GENERAL AGREEMENT ON TARIFFS AND TRADE (GATT)

Gatt is the principal international body concerned with the negotiation of reductions in trade barriers and promotion of international trade. Founded in 1947, the original membership of twenty-three (including Canada) has grown to 87. The membership accounts for more than 80% of world trade. An additional thirty-one countries apply GATT's rules to their trade. Since the inception of GATT, international trade has increased ninefold.

OBJECTIVES

1. To provide a code of rules under which International Trade can be transacted and expanded

2. To provide a forum in which countries can discuss and overcome their trade problems and negotiate to enlarge trading opportunities.

PRINCIPLES GOVERNING GATT INVOLVEMENT

1. Trade must be conducted on the basis of non-discrimination. Thus no country is to give special trading advantages to another.

2. Domestic industry can be protected through customs tariffs but not through other commercial measures.

3. A stable and predictable basis for trade is provided by the binding of tariff levels negotiated among the contracting parties. These bound items are listed in tariff schedules which form an integral part of GATT.

4. GATT provides the mechanisms for discussion and settlement of trade problems between member countries.

5. GATT provides waiver procedures whereby individual countries can seek a derogation from a particular GATT obligation. There are also emergency escape provisions.

6. A general prohibition of quantitative restrictions is a basic provision of GATT. A major exception could be made in case of balance of payments problems.

7. GATT permits regional trading associations within its framework because it recognizes efficiencies that should result amongst the groups and hence add to world trade. Regional trading arrangements, in which a group of countries agree to abolish or reduce barriers against imports from one another, have been established in many parts of the world.

8. The active participation of Canada in GATT has meant the dilution of the commonwealth preference system. However in many instances trade connections/contacts between commonwealth countries are still of great importance to Canada.

9. GATT negotiations have gone through seven rounds of bargaining, the latest being what is termed the "Tokyo Round" from 1973 to 1979. There has been some concessions on the part of "developed" countries to assist "developing" countries which form the bulk of GATT membership.

CONTACT

For more information on GATT and its effect on international trade contact:

D.G. Waddell
Deputy Director
Commercial Policy Division
Department of External Affairs
125 Sussex Drive
Ottawa, Ontario
K1A 0G2
(613) 995-8228

MULTILATERAL AGENCIES

INTERNATIONAL DEVELOPMENT BANKS

Canada is a member of the major international development banks which have been created to stimulate economic growth and social development in Third World countries. These multilateral development agencies include:

The World Bank Group
Inter-American Development Bank
African Bank Group
Asian Development Bank
United Nations Development Program

The procurement methods of all the banks are all subject to international competitive bidding. Their rules are well defined and fair. Generally the maximum margin of preference allowed local suppliers on projects is 15%. The procurement method is designed to maximize open competition among suppliers from member countries and public expenditures as well as afford developing countries the best buy for their money. Price is accorded heavy weight in the bid evaluation. Bidders must belong to member countries.

Renewables/solar manufacturers will do best who submit low bids, have technical strength and ensure that proposals are fully responsive to the specifications required by the borrower and its consultants.

Suggested Methods of Tapping into Development Bank Projects

1. Analyse the market realistically, choosing those countries and markets in which there seems to be potential for your firm.

2. Identify potential export opportunities through systematically monitoring various publications such as:

   a) World Bank Monthly Operational Summary of Proposed Projects. See World Bank.

   b) Development Forum: Business Edition. See UN and its agencies.

   c) Canada Commerce. See Regional Industrial Expansion.

d) World Trade News. See Canadian Manufacturers Association.

3. Checking with federal and provincial government sources. See Ontario International Corporation and R.I.E.'s Construction and Consulting Services Branch.

4. Formulate marketing and pricing strategies based on knowledge of the project, product specifications and the competition.

5. Implement marketing plans through contacts with the borrower and its consultant, including an explanation and emphasis of the product's special attributes and advantages.

6. Develop a strong bid including a low price and base it on a willingness to partially discount overhead and perhaps profit, depending upon competitor's cost and pricing flexibility, if this can be determined.

Obviously it helps competitive bidding by solar/renewables manufacturers if they are known to development bank personnel. However manufacturers do not register with multilateral agencies so they must monitor multilateral agency publications to apprise themselves of bid opportunities. It is clearly an advantage to manufacturers to be associated with international energy consultants to improve industrial intelligence and bid opportunities.

Consulting firms can register with the World Bank by writing to:

Mr. Maurice Dickerson
World Bank
1818 H Street N.W.
Washington D.C. 20433
U.S.A.
Tel. (202) 477-3577

Applicants can use the same forms to register with other multilateral agencies of interest merely by forwarding a copy to the appropriate agency. (See also individual banks below and Ontario International Corporation and R.I.E.'s Construction and Consulting Services Branch).

The major development banks are briefly reviewed below. A discussion of the UN Development Program will be found under The United Nations and its agencies.

THE WORLD BANK GROUP

The World Bank Group is the largest multilateral institution in the world. It accounts for almost 50% of the disbursements from multilateral institutions. Supported by 135 member countries, including Canada, it is the original and largest of the multilateral development banks.

The World Bank has two financial affiliates: the International Development Agency (IDA) and the International Finance Corporation (IFC). Both the World Bank and IDA lend for productive projects which will stimulate economic growth in the developing countries where it lends. The difference between the two is that, in the case of IDA, loans are made on extremely concessional terms to the poorest member countries.

Current (1980) energy-related investment by the Bank has an expected return of from 30% to 40%. (The investment return on loans to developing countries has always been high. For example, the rate of return on U.S. investment in developing countries was estimated by U.S. Treasury Department in 1976 as 25% about double the rate from developed countries).

The IFC was established to assist the economic development of less developed countries by promoting growth in the private sector of their economies. It is the private investment arm of the World Bank.

Since its inception in 1946 the World Bank has undergone some philosophical changes. With the OPEC oil crises, it realised that it was the least developing countries, with their extremely poor rural population, who were most deeply affected by rising prices. A commitment was made at that time to emphasize aid to these very poorest of the world's population. This is reflected in the dramatic increases in money allotted the agriculture and rural development sectors in recent years. This has come about somewhat at the expense of power projects however there have been numerous solar energy projects.

Attitudes to Solar Energy

The World Bank recognises that the "oil crisis" has seriously threatened the stability of both developed and developing countries. Not only is the economic stability of countries like Uganda threatened but also more developed and rapidly growing countries like Jamaica, Turkey and Brazil.

To meet critical energy needs, the Bank has proposed the creation of a separate energy development fund, or international lending agency. It would help developing countries boost domestic energy sources by increasing domestic energy production and conserving energy. The Bank proposal calls for a $25 billion five-year program which would require up to $7 billion in loan guarantees from the industrialized countries. With the $7 billion, the Bank hopes to attract an additional $65 billion in private investment to help the LDCs. Support from the U.S. and EEC has been withheld for numerous reasons, not the least is the funding commitment. This issue could be resolved in 1982.

The Bank is also placing more emphasis on renewable energy. In its report Energy in Developing Countries the Bank noted that "renewable energy holds considerable promise for the developing countries, and should, therefore, occupy an important place in the Bank's program for energy". It mentioned fuelwood, alcohol production, hydro power, solar thermal and electric power. Currently the Bank is concentrating on the first two energy forms since they are more developed and it has the in-house experience to evaluate them.

The World Bank sees solar energy technology at the research and development stage especially in its applications to the lesser developed countrires. To some extent the Bank sees itself as financing solutions to development problems not in funding demonstration projects. In this sense the Bank is interested in funding projects using "appropriate technology" which fit into the development plan of the country.

Within this context solar systems must be cost competitive. In most cases they are not. In 1980, the Bank had one expert in solar energy who was responsible for solar projects and demonstration programs.

The Bank considers that solar water heating using flat plate collectors is the most advanced solar thermal technology. While it emphasizes the rural sector, it could fund domestic solar hot water projects in urban areas provided they replace oil, are technically and economically viable, and create employment.

The Bank is particularly interested in low and medium grade industrial process heat. It is currently funding five studies to assess solar applications in these areas. The studies should be complete before the end of 1982. Monitoring the progress of the Bank's thinking about solar is a key piece of marketing intelligence for the solar marketer interested in the Third World.

Ambitious manufacturers may also consider encouraging contacts in developing countries to approach their governments for World Bank funding for development projects using solar thermal especially if there is a clear solar thermal component. This approach, if successful, will require some form of licence or joint-venture commitment on behalf of the Canadian manufacturer. It will also require a great deal of patience in dealing with the various bureaucracies!

Interested parties can find out about projects involving the World Bank and its affiliate, the International Development Agency by subscribing to the World Bank Monthly Operational Summary of Proposed Projects available for a subscription fee from:

John Hopkins University Press
Journal Division
34th and Charles Streets
Baltimore, Maryland 21218
U.S.A.

INTERNATIONAL FINANCE CORPORATION

This arm of the World Bank operates as a separate entity focussing on the least developed countries in the world. IFC maintains a one to four historical ratio between its investments and amounts generated from other sources for projects.

Historically IFC loans have been geared towards the manufacturing sector however in recent years there has been more concentration of sectoral diversification. Emphasis is being placed on the development of natural resources, both renewable and non-renewable and also a more active role in support of commercial, agricultural and service sectors.

IFC is potentially a source of funding new joint ventures in renewables technologies in the least developed countries.

INTER-AMERICAN DEVELOPMENT BANK

This Bank was founded in 1959 and has over 40 members, including Canada. Each nation subscribes a portion of the capital for the Bank based on a percentage of the country's gross national product. Over the years, the U.S.A. has provided 35% of the Bank's funds and Canada is sixth with about 5%. Loans in 1978 amounted to $1.9 billion in which 41% went to the energy sector. The biggest recipients of energy aid over the years have been Brazil, Argentina and Columbia. Energy loans have been made primarily for hydro-electric projects. IADB is interested in renewables technologies including flat-plate collector and P.V. systems. Like the World Bank, projects must be feasible technically, financially and institutionally.

Some funding has been granted for projects which have solar components but IADB Energy Sector is more interested in helping developing countries purhase proven systems from more mature industries. It is most likely that loans for solar projects will be for rural applications.

Before a project will be considered by the IADB, the total capital funding required must usually be at least $5 million. Smaller projects can be funded through local development banks within member countries. These smaller banks require private sector guarantees, and are also funding solar feasibility and demonstration projects.

Contact:

Gustavo Calderon
Chief
Non-conventional Energy Section
The Inter-American Development Bank
808 17th St. N.W.
Washington, D.C. 20577
U.S.A.
(202) 634-4579

THE AFRICAN BANK GROUP

The African Development Bank was founded in 1967. Along with the African Development Fund and the Nigerian Trust Fund, it comprises the African Bank Group headquartered in Abidjan, Ivory Coast. The African Development Bank contributed almost 50% of 1978 expenditures for the Group of $423 million. Traditionally membership in the Bank itself was open to regional countries only. This policy may be changed to permit funds from developed countries such as the United States and Canada. Membership would increase Canada's chances of gaining more reliable information and solar market opportunities.

The Group accounts for energy spending under public utilities. Public utility spending in recent years has been about 25% of funds disbursed. It is not known what the Group's attitude is towards renewable technologies.

Contact:

The African Development Bank
B.P. 1387 Abidjan
Ivory Coast
Africa

ASIAN DEVELOPMENT BANK

The Asian Development Bank was founded in 1966 and is headquartered in Manila. Canada is one of 43 members. The Bank provides technical assistance loans and grants and ordinary loans to those member countries in need of assistance. Japan is the largest contributor to the Bank over the years providing 17.5% of some 8.7 billion. Canada is sixth with about 6.7%.

The power sector has received the largest share of ordinary loans which make the largest share of funds dispersed. Funds have been used primarily to make major extensions to power transmission and distribution networks as well as providing new generation facilities and strengthening the facilities of medium-sized systems. Energy loans have gone mostly to Malalysia, Thailand, Indonesia and Pakistan.

Contact:

The Asian Development Bank
2330 Rox Boulevard
Metro Manila
Philippines 2800

MULTILATERAL AGENCIES

THE UNITED NATIONS AND ITS AGENCIES

The United Nations and its agencies have a variety of programs and projects in renewable energy that the Canadian solar exporter or potential exporter should know about.

The U.N. has had a long-standing interest in solar energy. In fact UNESCO organised a meeting on solar energy as early as 1954. The latest, and most important, was the U.N.'s Nairobi Conference on New and Renewable Sources of Energy in August 1981.

This conference produced the Nairobi Programme of Action, a U.N. document that stresses renewables such as biomass, wind and low head hydro as suitable technologies to replace imported fossil fuels. The U.N., like the World Bank, could support solar thermal hot water projects. Opportunities for Canadian manufacturers to export systems are virtually nil since the U.N. considers local manufacture more suitable for this type of relatively simple technology.

In photovoltaics, a combined United Nations Development Program/World Bank study indicated that solar pumps for drinking water and low lift irrigation were cost effective in some countries. Officials feel that technological breakthroughs which reduce electricity cost to $4/peak watt will increase U.N. projects in photovoltaics many-fold.

There are many U.N. agencies which have had energy programs or projects. These include:

1. World Health Organization (WHO)
2. Food and Agriculture Organization (FAO)
3. World Meteorological Organization (WMO)
4. U.N. International Children's Emergency Fund (UNICEF)
5. U.N. Environmental Program (UNEP)
6. U.N. Educational, Scientific and Cultural Organization (UNESCO)
7. U.N. Development Program (UNDP)
8. U.N. Industrial Development Organization (UNIDO)

It is beyond the scope of this study to review the solar energy opportunities that might exist in all these agencies. However the most active U.N. agency, the U.N. Development Program, will be discussed in sufficient detail for Canadian solar exporters to get some appreciation of the solar marketing environment. Activities of the U.N. Environment Program, and UNESCO are also briefly outlined. UNDP and UNEP are organizations of the General Assembly. UNESCO is a specialized agency of the U.N.

Generally, solar manufacturers should familiarize themselves with the key personnel in these agencies and monitor their thinking as solar technologies reduce in price and become increasingly more viable.

SUGGESTED SOURCE OF INFORMATION

The Development Forum: Business Edition is published bi-weekly and contains timely tender notices and advance information from all the major multilateral institutions for an annual fee.

Available from: United Nations
Palais des Nations, CH-1211
Geneva 10, Switzerland

See also International Development Banks, Suggested Methods of Tapping into Development Bank Projects.

UNITED NATIONS DEVELOPMENT PROGRAM

Created in 1965, UNDP is the most active U.N. agency in terms of solar development. It funds feasibility studies and technical co-operation projects at the request of governments. It also sponsors solar projects which are carried out by the centre for National Resources Energy and Transport (CNRET), a unit within the U.N. Secretariat, and specialized agencies in or outside the U.N.

In 1978, the UNDP aided 140 governments and worked with over 20 international agencies. UNDP does not have a separate division which deals with energy or renewables as such so funding allotments for solar are not easy to deduce. However, the UNDP has sponsored projects ranging from a solar salt plant in Cyprus and solar stills in Egypt has also provided $1.4 million (U.S.) to the government of Ghana for a three-year program to accelerate output of charcoal and increase efficiency of wood conversion to charcoal.

UNDP has also backed a small scale solar water pumping project by the World Bank and is considering the formation of a National Institute for Energy Studies to train energy planners from lesser developed countries.

OBJECTIVES

1. Surveying and assessing natural resources; industrial, commercial and export potential; and other development assets.

2. Stimulating capital investments to help realize these possibilities.

3. Training in a wide range of vocational and professional skills.

4. Transfering appropriate technologies and stimulating the growth of local technological capabilities.

5. Economic and social planning, with particular emphasis on meeting the needs of the poorest segments of the population.

SOURCE OF FUNDS

Primarily from voluntary contributions from governments (92%) of total of $648 million in 1978. Of this the U.S. was the largest donor $115 million or 19% versus Canada (7th) at 5.8%

DISTRIBUTION OF FUNDS

To distribute resources, an estimate is made of financial resources for the next five years. This estimate is divided into planning figures for each country or territory assisted (usually the poorest). About 15% of resources are set aside for multilateral projects.

Each potential recepient draws up its own "country program" outlining its priorities for UNDP assistance and allocating its share of UNDP resources among those priorties. These plans are received by UNDP's resident representative. Ideally the plans should take account of the country's overall development plans, domestic resources, and assistance expected from other external sources. Each country program is then submitted to the UNDP Governing Council for approval.

Finally, individual project requests are submitted. They must delineate each project's main objectives, its duration, cost and responsibilities of donor and recipient. Any project involving more than $150,000 U.S. of UNDP's money must be approved by the Governing Council. Projects $150,000 or less can be approved by the resident representatives.

On a given project, 45% of financing is typically from the U.N., with the remainder from recipient countries though supply of manpower, facilities, products and services. The UNDP goal is to eventually phase out its own involvement with national personnel taking over. This means recipient countries must develop local technical personnel as well as provide a measure of financing. All equipment purchases used in UNDP projects above $20,000 are governed by strictly observed bidding procedures.

SOLAR OPPORTUNITIES

For a solar or renewables program to be developed in a Third World country, it must initiate the request for assistance from the UNDP. There is still considerable ignorance in the Third World regarding solar technology. Educational programs are probably necessary in many cases before officials in these nations will be in a position to request solar technologies. Once the requests are made, the U.N. can be expected to give adequate attention to the requested program.

As already mentioned, U.N. resident representatives play a key role in project development. They, and key energy planners should be the targets for any solar education work contemplated in a Third World country.

Realistically, given the state of export development by Canadian solar manufacturers, it is highly recommended that they access the UN and its agencies by following the guidelines set down under International Development Banks, Suggested Methods of Tapping into Development Bank Projects.

UNITED NATIONS ENVIRONMENTAL PROGRAM (UNEP)

UNEP is in charge of one of the U.N.'s most far-reaching energy programs: the creation of energy self-sufficient communities and village power programs using photo-voltaics.

The champion of such projects has been Dr. Israd Usmani, a senior energy advisor to the U.N. Dr. Usmani envisons 1000 villages using PV power if the installed price can be lowered to $3.00 U.S. per peak watt.

UNEP has selected sites in Sri Lanka, Senegal and Mexico for demonstration village units or Rural Energy Centres. These centres, monitored by the centre for Natural Resources Energy and Transport (CNRET) will provide a 200 familly village with a renewable energy mix. The mix consists of solar energy, wind and biogas units to provide power for cooking, lighting, pumping water and running agriculture-based village industries. Focus at these villages will be on electrical power generation though use of PV arrays.

The Sri Lankan village system will have not only a PV array but also a concentrating solar thermal system, an Indian 10 kwh generator and 4 U.S. wind turbine systems producing 50 kwh. The Mexican village will have a PV array for irrigation and a 60 kw biogas generator for electrical power and cooking. The Rural Energy Centres will cost some $300,000 U.S. to set up and are undergoing several years of cost and operating data analysis.

UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANISATION (UNESCO)

UNESCO has participated in many energy studies, promoted solar workships and in co-operation with UNDP is setting up a Research Centre for Solar Energy in Mexico. This Centre will focus on photo-voltaics and thermodynamic solar conversion technologies.

UNESCO is organising similar centres in Ecuador and the Dominican Republic.

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